

Borg-Warner

The first 50 years

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Borg-Warner: The first 50 years

A history of Borg-Warner Corporation published in
its 50th anniversary year. By H. Lee Geist.

This is the story...

of the first 50 years of one American company.

of a company that was born full-grown—yet has never stopped growing.

of a never ending reach for new opportunity—sometimes missed, more often successfully seized.

of dedication to mechanical excellence—and sometime myopia toward human factors.

of many people—a handful whose names are well-known, and others whose names can be found only in company records but who really made it work.

It is the story of a company that has been different in every decade of its existence, and will be different again in the next one.

Borg-Warner has never had a label. At its birth in 1928, its interests and activities were varied. They still are.

At the end of 50 years, Borg-Warner is a leader in six major fields:

Air Conditioning

Chemicals and Plastics

Durable goods for a spectrum of industries, primarily to produce and transfer energy

Transportation equipment

Finance

Protection against fire, theft and violence.

Its sales in 1978 are well over \$2 billion.

Some 55,000 employees turn out 350 categories of product or service at over 50 major divisions, organized into six groups, with 140 plants on six continents.

During its history, it has acquired over 50 companies, large and small, yet over 80 per cent of its current revenue comes from products or activities that were internally developed.

At 50, Borg-Warner is also:

A company that believes in the inherent dignity of man, that every employee from production line to chairman's office should have equal right to a decent work environment.

A company where quality of product has always been the first requirement, not a slogan.

Borg-Warner is in its parts like many other companies. In its totality, it is unique. The only label it needs is its name.

1928-38: The parts come together

When Borg-Warner Corporation was born in 1928, America's love affair with the automobile was in full flower. A whole new social, economic and transportation pattern had developed around motorized wheels. To individuals, the automobile was the most desired single possession. It was the epitome of the American dream—prestige, pleasure and practicality all wrapped up in one package.

The automotive industry used 90 per cent of the country's oil, 80 per cent of its rubber, 75 per cent of its plate glass, 25 per cent of its machine tools and 20 per cent of its iron and steel. A full tenth of the total work force, directly or indirectly, was involved with the automobile. New highways were stretching out, the first drive-in restaurants and other services had opened. Living in the country—or at least the suburbs—was becoming a possibility for millions of city dwellers, and the cities were becoming available to rural populations.

1928 was the best of times. It was the crest of the post-World War I boom, one that many people expected to go on forever.

In the automotive industry itself, however, war raged. Car production had been doubling every five years, and in 1928 the annual rate was well over 4 million, but the ranks of car manufacturers had been tightening. Brand names had shrunk from about 180 pre-war to less than 50. General Motors had been fully formed by 1924. Chrysler completed its essential four-division structure in 1928. Ford had been the top selling individual car for almost a generation.

As the numbers of car manufacturers had shrunk, so had the number of producers of components. In the Twenties, most car makers were still essentially assemblers, packaging parts, sometimes standard, sometimes made to specification, under

different-looking bodies. Cars could be—and sometimes were—made in backyard garages.

Most parts makers were specialists. With the intense competition, loss of a single major customer could knock a supplier out of business overnight. The car manufacturers, with their growing power, often squeezed their parts suppliers by threatening to change a source, or even make a part themselves. In fact, some companies were increasingly making their own. It was becoming obvious that single-part makers were vulnerable, and some were uneasily beginning to look for allies.

That was the situation in early 1928, when John Fletcher and Paul H. Davis, both Chicago investment bankers, invited a group of men to be their guests at a dinner. Among their guests were George Borg of Borg & Beck Co., J. R. Francis of Marvel Carburetor Co., Ray P. Johnson and Charles Davis of Warner Gear Co., Eric S. Eskstrom of Mechanics Universal Joint Co. and Lester Dryden of Long Manufacturing Co. All of them had done some financing through Fletcher or Davis, and all of them had tentatively discussed with the bankers the possibility of maybe, someday, merging with somebody. None of the industrialists had ever met each other before, but they hit it off immediately—and negotiations to form a new group began almost the next day.

The new company—named the Borg-Warner Corporation after two major components of the group—came into being on June 5, 1928.

Before the merger, all four of the original partners had had established positions. Warner Gear, through standardization, had cut transmission costs in half during the Twenties. Borg & Beck had developed a cheap and highly efficient single-plate clutch. Mechanics had pioneered the standard

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“oil-tite” universal joint. Marvel was the leading maker of the carburetor then in most general use. Established or not, all of them were very aware of the growing pressures of their marketplace.

“What we want,” said George Borg, head of Borg & Beck and first president of Borg-Warner, in an early statement, “is a corporation which cannot be made or broken by the fortunes of any single division, or the market for any one product. We have organized so that we can fight the better. A manufacturer who might be ruthless toward the producer of a single automobile part will think twice before attacking the maker of many parts. Let us make as many parts as we can—so that if our competitors press us too hard in one line, and we must sacrifice it, we can still operate on the others.”

Neither Borg nor the other company heads, however, were willing to submerge the identities of their own companies. Instead of agreeing to an outright merger, therefore, they established Borg-Warner as a holding company. Each of the participants maintained its own identity and operating methods. The corporation supplied the fiscal glue.

The idea struck fire. The market obviously liked the idea; the price of the stock of the new company rose by 50 per cent within six months—and other companies flocked to join the confederation.

In just a trifle over a year, Borg-Warner included five more operations whose combined sales were a third again larger than those of the initial four.

Galesburg Coulter Disc Co. (later to be named Ingersoll Steel and Disc) was the first. Galesburg was a leading producer of discs used for plowing, and had developed a special steel rolling technique that was useful in making both farm implements and key automotive parts.

Long Manufacturing made radiators and clutches. Long was supposed to have been part of the initial group, but some legal questions had held up its entry for another eight months.

Morse Chain—which had once made a solid gold bicycle chain for Diamond Jim Brady to present to Lillian Russell—was the leading producer of timing chains. Rockford Drilling Machine Co. made machine tools and industrial clutches.

Norge Corp. made some new-fangled “electrical iceboxes,” but was essentially a holding

company for a larger subsidiary, Detroit Gear & Machine Co., a manufacturer of gears and transmissions.

Two months before the great market crash of 1929, the confederation was essentially complete. These nine tribal fiefdoms were to remain the heart of Borg-Warner for almost 25 years.

All were related to the automotive industry, directly or peripherally. Each made something that was essential to a basic vehicle: clutches, gears, transmissions, radiators, carburetors, universal joints, chains. Each had a leading position in its own specialty.

As a group, the combined sales in 1929 reached \$54 million, making Borg-Warner a major factor in the automotive industry immediately. It was far smaller than the big three auto companies, to be sure—but ranked close to such car makers as Nash, Studebaker and Packard, and well ahead of most other parts makers.

There was some product overlap among the BW subsidiaries; three of the companies made clutches, three made transmissions. Where overlap existed, competition, not combination, was to determine survival.

The nine companies had the same customers and parallel technology in common—but little else. Each considered itself as still independent. Borg-Warner was not considered as a parent—it was known at the beginning and for many years afterward as the “central office,” basically the central bank for the group. Borg-Warner was to convert from a holding company to an operating company status in early 1935, in order to consolidate sales and earnings for tax and financial reasons. Only the paper status changed, however; the charter of the corporation still stated specifically that “Borg-Warner may be considered as a federation, and the individual divisions retain all powers not expressly limited to the central corporation.”

The philosophies that were to guide, or to dominate, the operations of Borg-Warner through much of its history, and to be the roots of both its strengths and its weaknesses, were really established from the day the merger began.

Black Friday ushered in a new economic world.

Between 1929 and 1932, new car production fell by a terrifying 75 per cent. Selling new cars became an utterly cut-throat business. The majority of parts makers just disappeared. Only the strong survived.

Borg-Warner was one of the strong. Its rationales, and its timing, had been right.

Most of its products were industry standards, and usually had strong patent protection. Until something better came along, in many cases, the auto companies simply could not cut them off entirely, even though the volumes went way down, and the price pressure intensified.

Sometimes something better did come along. Marvel, for instance, might have been badly hurt in 1930 when a newly developed competitive carburetor, more effective and less expensive than its own product, swept the market. The fiscal strength of the group, however, kept Marvel going until it was able to come up with an improved product of its own.

At the same time, innovation continued inside the Borg-Warner companies. The most talked-about advance in motor car design in 1930 was its new "Free-Wheeling" transmission. The system—whose name became the catch-phrase that exemplified American social life of the Thirties—was being used by 12 leading car manufacturers by the 1932 model year.

The group was also helped by the fact that Borg-Warner was headed by perhaps the one man in the original confederation who was right for the job at the time—Charles S. Davis.

On the official merger, George Borg had been elected president (then synonymous with chief executive officer), and Davis made chairman of the board, a more "honorary" position. But Borg, who liked high living and dabbling in a range of personal ventures, as well as running his own subsidiary, was bored with the essentially financial details of the holding company. He casually suggested that he and Davis switch jobs.

The rest of the board—made up mostly of the heads of the subsidiaries—didn't care. All of the company heads were entrepreneurial types, individualistic, intensely competitive, with strong production backgrounds. All of them had built their

own companies, and were interested primarily in continuing to run them.

On the other hand, Davis was a "figure" man. As treasurer of Warner Gear, he had been active in the negotiations that led to the formation of Borg-Warner, but he had never been a production man. He was atypical in a number of ways. Davis was a Harvard graduate; those of his colleagues who had college training had gone to schools closer to home. He had put in a spell as yachting editor of the New York Times, and had several years of miscellaneous business experience, including a period with a toy company, before joining Warner Gear.

If Davis was not cast in the entrepreneurial mold, he was excellent at handling people, soft-spoken, unflappable, urbane. He had a natural talent as negotiator among the rambunctious—and actively competitive—men who headed up the separate companies.

As strongly as his associates, Davis believed in divisional autonomy. He, as well as they, expected every division head to run his own "company" exactly as he wanted to as far as products, operations and sales were concerned. On financial matters, however, they deferred to Davis. Where a group consensus was necessary, he could usually steer them.

He was also a fiscal conservative. Although the company had a loss of about \$600,000 in 1932, the year-end balance sheet still showed almost \$8 million in cash and marketable securities on hand, against total current liabilities of only \$1.1 million. By 1935, all the company's funded debt—inherited from some of the merged companies—had been paid off. That conservatism was to last throughout his 21 years as head of Borg-Warner. Davis flirted once or twice with the idea of borrowing funds, but he never actually did. When he stepped down in 1950 from the chief executive post—although annual sales had grown six-fold since he had started, and many millions had been invested in capital improvements—his last annual report specifically noted that the company still had no debt of any kind.

Conservatism, however, could hardly stem the forces of depression. The 75 per cent slide in new car production that was wiping out its competitors left and right was just as rough on Borg-Warner. Its sales sank 60 per cent, from \$54 million in 1929 to only \$22 million in 1932. Actually, its sales of origi-

Davis asked the price for Detroit Gear without this strange Norge refrigerator. Howard Blood, president of both, retorted that the price was the same, with or without Norge.

nal equipment directly to carmakers had dropped by a greater percentage. Yet because it survived, it also picked up a larger share of what business there was.

At the same time, the group found it could do some things that none of the companies had been able to do individually. Until the merger, the limited-product individual companies had as customers only other manufacturers. Now they had a whole line of essential components to sell. The Borg-Warner Service Parts Co.—really the first operation of the corporation itself—had been organized in 1930 with five sales and distributing branches across the country to merchandise replacement parts to the growing service industry. With fewer people buying new cars, repairing old ones became more important, and the replacement business did well during the Depression years.

What really cushioned the sag, however, was something that the automotive-minded men of Borg-Warner had scarcely dreamed of. That was the “electrical refrigeration” business.

When Borg-Warner acquired Norge in 1929, it really only wanted Detroit Gear, technically its subsidiary. Davis asked the price for Detroit Gear without this strange Norge refrigerator. Howard Blood, president of both, retorted that the price was the same, with or without Norge. Without enthusiasm, the Borg-Warner board accepted the package, figuring that the refrigerator side was worth about what it cost.

Blood had had very much the same reaction from his conservative directors at Detroit Gear previously. A few years earlier, he had been one of the first to see the possibilities in a new appliance, a movable “plug-in” refrigerator, with compressor and food box combined in a single unit. He had purchased the patents, and fought his directors in order to produce and promote his “Norge Rollator” refrigerator. When his board ordered him to stop making them, he found the financing to buy out Detroit Gear personally. As a further gesture to make his point, he made Norge the parent company and Detroit Gear the subsidiary. At the time of the merger, he was selling about 6,000 refrigerators a year—with a sales volume less than one-sixth of

Detroit Gear’s automotive components.

If the beloved automobile was in trouble after the crash, Borg-Warner’s people gave no chance to this strange mechanical ice box. Only it didn’t work that way.

Depression or no, the American public was off on a second love affair—with home appliances. A quarter of the work force was unemployed, and money was very tight. For those who were working, however, and had some money to spend, the new appliances promised—and actually delivered—economies over earlier methods. The “Rollator” design caught the public fancy. By 1931, Davis was reporting, with a stark note of surprise, that “the sales of Norge refrigerators were greatly in excess of anticipations.” In 1932, with everything else sagging, “refrigerator sales were greatly increased over 1931,” and Norge was even getting a new plant to house expanded operations.

From then on, Norge and Borg-Warner were definitely in the “appliance” business. In 1934, Norge bought the Detroit Vapor Stove Co. to add a line of gas ranges. On its own, it was developing semi-automatic clothes washers and oil burners. By 1935, Norge was accounting for a full quarter of Borg-Warner’s resurgent sales, which were already back up to three times the 1932 low.

Its product line included not only refrigerators and ranges, but clothes washers and ironers, oil burners, space heaters and a “Fine Air” furnace that “warms, filters, humidifies and circulates the air in every room of the house” with an optional air-cooling addition based on its refrigeration technology.

The worst was over, and Borg-Warner was heading for record years. The divisions had expanded into components for trucks and farm tractors, and industrial clutches, transmissions and chains. Ingersoll Steel and Disc had initiated the acquisition of a couple of small steel specialty operations.

The company regularly made noises about looking for more opportunity outside the automobile industry—but the automotive market was surging again. With record sales and earnings in 1937—coming mostly from passenger car components—nobody at Borg-Warner was too unhappy about the mix.

The second crash that hit in 1938 cut the

company's sales in half. This time it was across the board. Appliances were hit as hard as automotive equipment.

In spite of the enormous volume loss, the company almost broke even—it had a net loss for the year of less than \$20,000. That was the last time in history that it failed to show a substantial profit.

The financial reserves of the corporation were an important factor, of course. But the decentralized operation proved its value at a time of sudden change. Individual divisions could react fast as specific conditions affected each one. The second major shakeout of the decade wiped out more small companies. Borg-Warner divisions moved in to pick up the customers. In 1939, Davis happily noted that “we have not only retained all the contract business we enjoyed in 1937 in the automotive, agricultural and manufacturing industries, but we have added to our sales outlets.”

The aggressive competitiveness of Borg-Warner divisions—even with each other—was legend.

If two divisions made a similar product, they competed as violently with each other as they did with total outsiders. At one point, two divisions making transmissions were both after the same Ford Motor Co. business. Ultimately, simultaneous presentations were given to Henry Ford himself.

According to one story, Mr. Ford finally interrupted the increasingly heated argument and said, “Gentlemen, I know you have a tradition of competition, but is it really necessary to call each other ‘sons of bitches’?”

Apocryphal or not, it would have been representative of the Borg-Warner system for many years. Division presidents ran their own shows. Each decided what to make, to whom to try to sell. Each decided how many workers to hire, what materials to buy, from whom and on what terms. Each division had its own sales and distribution staffs, advertising agencies, and sometimes local legal counsel. They did their own planning and their own research and development. Every division even had its own board of directors (they were called “supervisory boards”) and Davis and corporate legal and finance

officers did sit on each one. But they met only once a year—and by then often could only ratify what had already been done, good or bad.

The “everybody-else-is-an-enemy” syndrome lasted for quite a few years. Once, at the end of the Forties, a group from Borg & Beck division went to visit Long Manufacturing to discuss a new technique that Long had developed, one that should be applicable to the products of both divisions. They were not allowed in the door.

Keeping these soloists operating in harmony at all was a full-time job for Davis, but he had some leverage. The corporation retained the power of the purse—the divisions had to ask Chicago headquarters for capital funds. The central office was able to provide services—its patent department, for one—that the divisions could not individually afford.

While each division was consolidating its own positions and markets, Davis also went looking for new fields to conquer—fields that were not expressly in the province of existing divisions.

Slowly and carefully of course. Davis was nothing if not conservative. Even toward the end of his tenure, despite the enormous growth during his administration, he still believed it was safer to be under-built than over-expanded.

He did initiate the things that could only be handled by the parent company: creation of the Service Parts Division, and of Borg-Warner International Co., which was intended to promote sales for the products of all divisions overseas; the creation from scratch of a new production division to make springs, filling an obvious gap in the line; branching off into an entirely new industry with the acquisition of a company that made aircraft pumps (Pesco) just before a conflagration erupted that was to change the airplane from a novelty to a major world force.

What turned out to be one of his most significant moves—moving into the chemical business—may have been almost an accident. In the Thirties, the chemical industry was already a giant, but it was a field nobody in the entire Borg-Warner complex knew—or cared—anything about.

George Borg, who was chairman of the board, had invested privately in a small experimental chemical operation first called Marsene Corp., then Marbo Products Corp., and later the Marbon Division.

Marbo had no active products, no specific markets, no customers—but it did have patents on one promising product line, rubber hydrochloride derivatives, and an unusual process to produce them. Borg had lost interest and wanted to unload. For only \$500,000, Davis felt it might be an inexpensive way of testing the chemical business.

Marbo was bought in 1934. By 1938, its total annual sales were still only \$9,000, and it had racked up cumulative losses of another \$500,000.

Instead of dumping it, Davis brought in a new man, George P. F. Smith, to see if anything could be salvaged. Smith found two developments that might have potential. One was an adhesive that could bond rubber to steel; the other was a resin that added strength to rubber and provided some unusual electrical insulating qualities. Even though 1938 was a bad year, the company's balance sheet was so strong that it could gamble a little more. Three years later, the fledgling was still going nowhere. By the end of 1941, cumulative losses were over \$1 million.

Suddenly, Davis' gamble began to pay off. Marbo products were in great demand. Many military products required rubber-to-steel bonding for which Marbo's adhesive was ideal. And Marbon B, the reinforcing resin, turned out to be the perfect insulation for sheathing electric cables used for radar equipment and for millions of miles of field telephone cable.

One other important Davis development was less inadvertent.

The divisions did all their own research and development—and managed to keep adding improvements to their lines. Synchronizers to aid gear shifting, overdrives and improved roller bearing universal joints were only a few of the important developments of the Thirties. Consumers almost never saw such products, but the automotive and industrial customers knew their importance. Automobile companies particularly had to keep offering something new to the public every year; the need for constant improvement kept the partsmaker looking ahead.

There was one trouble in this system. An

autonomous division could get somewhat parochial in thinking about products and markets—and if it didn't want to work on something new, that was the end of it.

For 50 years, cars had been driven with manual transmissions, a lot of them made by Borg-Warner divisions or their predecessor companies. Borg-Warner had contributed enormously to making the manual transmission the smooth, easy-to-handle device that it was.

For as long as Borg-Warner has been in existence, however, the automotive world had been talking about a possible "automatic" transmission that would require no shifting by the driver.

Despite urging, Borg-Warner's transmission-making divisions were doing little about it. In fact, the chief engineer of the major transmission division in the late Thirties published an article that "proved" that an automatic transmission was impractical and uneconomic. It appeared just two months before General Motors announced that it would offer an automatic on some of its higher-priced models.

Davis knew that if Borg-Warner was to retain any real position in the transmission market, it would have to develop a good automatic—and that the corporation would probably have to do it independently of the divisions.

So in 1939, Davis established at Rockford, Ill., the corporation's own "experimental laboratory." Its charter was to devote its attention to "experimental developments which can not conveniently or adequately be undertaken by any of the divisions." Since the divisions apparently found it inconvenient to work on an automatic transmission, Davis put a group to work on one at Rockford, including at least one man, hired away from General Motors, who had been instrumental in that company's automatic transmission development.

The Rockford group came up with one—or at least the concepts were worked out there. The final engineering for commercial development was actually done by the divisions—but if Davis had not forced that issue, the company might never have achieved the position it did.

1938-50: Planning for war—and beyond.

Borg-Warner had changed within its first decade. It had begun as a defensive hedge by a group of auto parts makers. It had become, within a very short time, diversified enough to ride out the worst depression in history, and come out stronger than it started.

World War II changed the face of Borg-Warner again.

The United States had started building up its defense effort in 1940, well before the Japanese attack brought the country actively into the war. Borg-Warner was more interested in its own developments. It was creating a new division—to make springs. The new Spring Division branched out so quickly that a second plant was needed before the year was out. Norge was booming, and a “new and improved” line was being introduced. But Borg-Warner was picking up “war work” willy-nilly.

In April, 1939—months before the war had started in Europe—Davis and his colleagues had made one of their periodic moves to “lessen dependence on the automotive industry” with the purchase of the Pump Engineering Service Corp., later known as Pesco Products.

Pesco’s aviation pumps had an annual volume around \$2 million (compared with Borg-Warner’s \$65 million at the time) but represented a new market, and manufacturing and engineering techniques with which Borg-Warner personnel were comfortable.

Before 1939, aircraft production had been relatively limited, but Pesco pumps did go into some 70 per cent of all the American aircraft being made, and a somewhat smaller proportion of British planes. By 1941, before the United States was at war, but with aircraft production gearing up, Pesco sales had already increased six-fold.

When Pearl Harbor hit, all the Borg-Warner divisions moved fast. Within four months, three-quarters of its production was going, directly or indirectly, to the military. By the end of 1942, conversion was complete.

World War II was largely a motorized war. Most of Borg-Warner’s automotive products dropped neatly into the making of the enormous number of vehicles, large and small, that moved American soldiers and equipment all around the world.

Transmissions, clutches, gears, carburetors, universal joints, radiators went with little change into Army cars, trucks, armored vehicles and tanks—many of which were being produced by Borg-Warner’s regular customers. So did various wheel discs and chains. A number of specialty steel products found a ready use in military construction.

Norge had a slightly different problem. Before America’s involvement actually began, a production chief of the National Defense Commission told Howard Blood that Norge didn’t fit into any defense plans because “home appliance factories aren’t worth a damn in war work.”

Blood found work for his plants. Norge sold consumer products—but it was also a good “metal bender.” The military needed some appliances—but Norge also produced millions worth of hydraulic turrets, cowlings and other aircraft parts. Detroit Gear, which Blood also headed, turned out most of the massive Oerlikon gun mounts for the Navy.

Ingersoll Steel and Disc Division stopped making sinks, tubs and furnaces and turned its stamping machines to helmets and artillery shells. Ingersoll Steel and Disc also produced Borg-Warner’s most spectacular military product—the Beach Buster amphibious tank that led the way in many key

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attack landings in both the Pacific and Europe.

As the war effort expanded, Davis followed tradition and left his division chiefs to follow their own bents. They had fanned out and found the military contracts they wanted, and were producing quality material in steadily increasing quantities.

Volume was skyrocketing. In 1940, the last entirely "peacetime" year for the company, sales had been \$75 million. By 1942, that had almost doubled to \$145 million, and almost doubled again to peak at \$254 million in 1944.

But before Borg-Warner had even completely converted to war work, Davis was already getting ready for the return of peace.

In early 1943—long before the tide had turned in the Pacific or the mighty Allied forces invaded the continent of Europe, long before the ultimate decision, no less the timing, was clear—Davis called the first of the meetings that were to go on at frequent intervals over the next two years to plan for reconversion.

Davis had realized early that an American public deprived for years of its two major loves, automobiles and appliances, was going to be very hungry for them afterward. He intended to be ready—and he forced his division presidents, busy as they were with production, to think the same way.

In five years, Borg-Warner turned out some three quarters of a billion dollars of "war work," winning an array of pennants and awards in the process. When the war ended, everything was in place for the next effort.

Detailed layouts had been made for plant reconversion, and procedures established for contract terminations. Relatively little changeover would be necessary for many of the automotive products, but the requirement for new ones had been anticipated. Work on the automatic transmission had continued—successfully—and engineering work on the concepts had been pretty well defined for differing versions at two divisions.

At Norge, designs for new model lines of appliances were ready. With the war still on, Blood had bought two more available factories and started laying out single-purpose production lines for indi-

vidual appliances, so he would never have to return to the production jumble he had faced during the Thirties as product after new product was added hurriedly to provide a full line.

Ingersoll Steel was preparing to invade the home construction market, expected to boom after the 15-year lag caused by depression and war, with an intriguing new concept. Its "Home Utility Unit" was an integrated one-package assembly containing a furnace, hot water heater, plumbing, water and gas pipes, conduits and connections for all kitchen facilities, bathroom fixtures and laundry equipment.

Physical plant had been expanded during the war—and paid for. Conservatively, Davis had expanded no more than had been necessary to meet the military needs—but that had been more than three times Borg-Warner's pre-war volume. Davis expected to be able to use every bit of it. In fact, plans for still another \$30 million worth of additional and more modern plant had been drawn up, and the cash put aside for it.

The war did not mean great profits for Borg-Warner. "Excess profits" taxes siphoned off the flow from larger sales. In its peacetime record year, 1937, Borg-Warner had earned a net profit of \$8.4 million, after taxes of \$2.2 million. In 1942, on twice as much volume, it earned a net profit of only \$7.2 million—after paying taxes of \$20 million. However, it had financed all of its war work and physical expansion out of its own cash flow, and it ended the war with a more-than-adequate physical plant, an efficient work force, no debt of any kind, and a solid amount of cash to finance its new attack on civilian markets.

The planning proved out.

After a short sag caused by abrupt military contract terminations, sales took off, particularly for the automotive divisions. In 1940, sales to the automotive industry had been less than \$40 million; by 1950 they had climbed to over \$200 million.

Moreover, the immediate postwar period marked the start of one of Borg-Warner's greatest single successes. The "experimental laboratory" and the divisions between them had developed an

effective kind of automatic transmission. It worked so well that its basic principles were ultimately to be adopted by others who had started with differing systems.

Borg-Warner's automatic was really the first available from an independent. General Motors and Chrysler by this time had both developed their own systems. Ford had not—and couldn't compete without one. Studebaker and Packard were in similar, if smaller, boats.

Borg-Warner actually had two versions, identical in basic principles, but differing in details to meet the promotional requirements of competing customers. By 1949, Detroit Gear was delivering one version to Studebaker. Warner Gear was supplying Ford Motor with the other, initially for the Mercury, then increasingly for the entire Ford Motor line. The automatic transmission produced by Warner Gear was to become for almost a decade the corporation's biggest single product, and far and away its most profitable one.

Unfortunately, not everything was doing as well.

The Utility Unit turned out to be a noble failure.

The system worked well. The price was right and builders liked it. The U.S. government, through the Commissioner of Housing, had put its blessing on it. The officers of the big "international" construction unions had okayed the concept. But when the units were delivered to construction sites, journeymen on the ground refused to install the units until they were completely disassembled and the individual parts reinstalled separately. The Utility Unit had to be reluctantly shelved as an idea that was ahead of its time.

Marbon was floundering.

With the end of the war, the market for its adhesive and reinforcing resin largely evaporated. There were possibilities with new compounds—one high styrene resin was mildly successful. The division's chemists, headed by Robert Shattuck, a young chemical engineer who had joined the division in 1942, had some ideas for products involving butadiene, the synthetic rubber base that had replaced natural rubber during the war. Potential markets included such disparate items as shoes and phonograph records.

Throughout the late Forties, however,

Marbon had only a few minor products to sell and was still casting about for its destiny. Shattuck noted at the time that there was no point in trying to break into existing large volume areas. Marbon had to find products of "sufficient novelty to allow patent protection—to develop materials that do an unusual job and thereby justify price premium."

Corporate headquarters at the end of the war had authorized a new chemical plant at Gary, capable of turning out 12 million pounds of resins annually, and approved relatively high research expenditures. The new plant was ready for operation in 1948—and remained essentially unused for the next five years. The division drifted along, not quite breaking even, but the corporation continued to carry it, gambling that chemicals still had future potential for Borg-Warner.

And Norge got into serious trouble.

Norge's postwar refrigerators were defective; they were costing a fortune in warranty claims, and were throwing a pall over the entire brand line.

The problem was technical—but its root traced back to a profit-sharing system that had started in the company's earliest days.

By the mid-Thirties, Norge had ranked among the top four or five makers of refrigerators. About that time, most other refrigerator makers switched to a new, non-toxic, heat-transfer agent, Freon. Norge stuck to the material that it had traditionally used, sulfur dioxide, because the substantial redesign that was necessary would have cut into immediate division profits. At war's end, Norge no longer had a choice. Everybody else was using Freon.

Blood had prepared for so many postwar conditions, both at Norge and at Detroit Gear, which he also headed as its president and chief executive officer. Somehow he had overlooked this problem. If Norge were to get its share of the obviously voracious market, it had to do something quickly. Borg-Warner's overall reputation rested on careful engineering and quality production. For the first time, one of its divisions got careless with engineering because of the lure of the market. The new refrigerant system, thrown together too fast,

didn't work as well as it should have.

One engineer with Norge at the time insists that the entire problem arose because a purchasing agent ordered that one specific part, a roller, be made by a different casting method in order to save three cents per part. The "cheaper" roller, he says, wore out too quickly and prevented proper compression of the refrigerant.

The complaints came flooding in. To protect its own name, Borg-Warner honored all warranties. By the time the system was corrected, Borg-Warner had lost some \$16 million. Howard Blood, who had created Norge through his personal faith in electrical refrigeration, resigned his operating posts in 1949.

The concern for immediate division profits that caused the problem was not limited to Norge. The same reasoning was to cause problems at other divisions before the system was changed. It traced back to a classic institution, dating almost to the corporation's inception, known as "The Fund." Provisions varied from time to time, but the essence remained intact for years.

It worked this way. Division operating profits were split roughly three ways; a fixed percentage was allocated for future capital investment. Somewhere between 4 per cent and 10 per cent went for bonuses to a small group of top division executives. These two categories made up "The Fund." The balance of the operating profit was transmitted to the central office for taxes, administrative expenses, dividends and reserves.

The bigger the division's operating profits, the bigger the individual bonuses, which could go as high as 100 per cent of base salary. The theory, of course, was that the more a man stood to gain, the better he would work to make a profit. The fallacy, which was to show up more than once, was that division managements on occasion failed to do necessary things. Sometimes even simple plant maintenance was allowed to slide if it might reduce operating profits at all.

Much later, in fact not until the Sixties, this system was changed to reduce the emphasis on immediate local profit at the expense of long-term requirements. Future bonuses would be based on a formula that included total corporation results and a number of individual performance requirements, as well as specific division profit.

Despite the problems, Borg-Warner's total business boomed.

Its three clutch-making divisions, Borg & Beck, Long Manufacturing and Rockford Clutch, handled some 75 per cent of the total U.S. clutch supplier business. Borg-Warner was the largest independent producer of transmissions. In a number of other areas, its divisions were leaders if not necessarily dominant.

Between the first postwar year and 1950 when Davis stepped down, earnings climbed from \$9 million to a record \$29 million. Plant had been expanded considerably, except for a small amount of preferred stock the company was still debt-free, and just cash and government securities on hand totalled \$72 million, more than the company's total liabilities.

1950-60: The Frantic Fifties

When Davis finally decided to relinquish, at 73, the post of chief executive officer, he handed the mantle to Roy C. Ingersoll.

Roy Ingersoll had run Ingersoll Steel and Disc Division for the 21 years since the merger, and for a number of years before that when it had been Galesburg Coulter Disc. He was recognized as a competent executive, but his election still raised eyebrows. He was just short of his 65th birthday, a time when most men are getting ready for retirement. And he was so utterly different from Charles Davis that the change in personal style had to affect the corporation.

Davis had been content in his major roles as central banker and general coordinator. Ingersoll wanted to *run* the corporation. Davis was a planner and an analyzer; Ingersoll was impulsive. Davis was soft-spoken, polite, urbane. Ingersoll was a practical joker and often heedless of the feelings of others. Colleagues say that if he was domineering and rude, he also had enormous energy and vitality even at 65 and he was a superb salesman. He was difficult to work for, yet he attracted intense personal loyalty.

Ingersoll inherited a company that was rich, technologically sound, and successful in many ways. He also inherited an assortment of problems and frustrations.

Norge had still not recovered. George P. F. Smith had been shifted from Marbon the year before to try to salvage the big operation. While he was helping to slow the exodus of distributors and dealers, he had not turned the operation around, and it was still losing money heavily.

The Korean War started just a few months after Ingersoll took his new office. This time war was no help. Since it was officially only a "limited police action," military production was superim-

posed on full consumer production. That created shortages of critical materials, higher labor costs and waves of strikes, and heavy start-up expenditures on Borg-Warner's new defense projects. Defense work boosted sales—and reduced earnings.

The automotive divisions were going great—but a full two-thirds of the company's business was going to the automotive industry, compared to less than 50 per cent of a much smaller volume before the war. Ingersoll knew that the issue of vulnerability, which had brought about the creation of the corporation in the first place, had not gone away. He was less attuned to cars than most of his colleagues—only a small part of his own division's operations has been directed at Detroit. He wanted to move in other directions, but little was immediately available.

He was frustrated, as his successors were to be, by the organization of the company. When Ingersoll had been running a division, he had taken complete autonomy for granted. On a couple of occasions he had made his own acquisitions without asking, simply assuming that the corporation's board would, as it did, ratify them afterward. Sitting at the top, it looked a little different.

Forty-four different persons reported directly to him—35 division heads and an assortment of staff people—representing a wide spectrum of activities and policies, and a wider range of success in operations.

There was little time for communication. Besides, given the tradition of decentralization and divisional autonomy, there seemed little that Ingersoll could do about the organization. The central office had only two real controls over a division: it could refuse to allocate further capital funds; or it could fire the division president. Both required per-

The consulting firm looked at what was the most decentralized organization in American industry and in late 1952 recommended a major restructuring.

suading a board that was wary of establishing too many such precedents.

In general, Roy Ingersoll's first three years in office were unremarkable—except for a decline in earnings from the record levels at the time he took over.

He had made two small acquisitions in 1952: E. C. Atkins & Co., a maker of saws for both industrial and home markets; and Reflectal Corp., which produced an unusual form of insulation consisting of layers of aluminum foil. Both were minor for a company of Borg-Warner's size. Reflectal cost Borg-Warner stock valued at about a half-million dollars, and Atkins came for about \$3.5 million worth. Both were a long way from the automotive industry, both were slightly related to the construction field that had long fascinated Ingersoll. Neither was ever to be very successful within the Borg-Warner complex.

The tenor changed in the company's 25th anniversary year. Some of the developments of 1953 would continue to affect the company for the next 25 years. The key ones:

- The first restructuring of the company in 20 years was started.
- A new contract was signed with Ford Motor Co. for automatic transmissions.
- The chemists at Marbon, after literally 50,000 different trials over almost 10 years, finally made a breakthrough with a major new thermoplastic, called Cylolac ABS.
- The B-W Acceptance Corp. was created.
- And a man was located who could help rebuild Norge.

Roy had been persuaded—mostly by his son Robert—to have an outside consultant prescribe for his organization problem. The consulting firm looked at what was the most decentralized organization in American industry and in late 1952 recommended a major restructuring. Ingersoll, a pragmatist if there ever was one, knew that could not be done without destroying the company. Six months later, he tried a limited restructuring to take some of the load off himself.

He appointed two "administrative vice presi-

dents"—his son Robert, who had been heading up Ingersoll Products Division, and Lester G. Porter, who was treasurer of Borg-Warner at the time, and had earlier been with Calumet Steel Division. In theory, each of the three would watch over a group of divisions for more effective management.

Actually, there was no attempt to organize logical groups. The distribution, Robert Ingersoll recalls, was rather whimsical. The three men sat down and Roy would say, "Okay, I'll keep this one; Bob, you take that one, and Les, you take the next one."

The restructuring did not decrease the autonomy of the divisions, but it did serve several useful functions. It permitted just a little more communication between the corporate office and the divisions, so there was more information flow in both directions about what was going on, and it did set the beginnings of a pattern that permitted more effective reorganization later on.

The big decision of the time—chewed over during much of 1952 and resolved in 1953—was what to do about Ford and the automatic transmission.

Borg-Warner's automatic transmission was unquestionably a technical success. From the time they were generally introduced in 1949, there was no question that automatics generally would replace most of the manual transmissions that had always been an important part of Borg-Warner's business. Since the price of an automatic transmission unit including the converter, the company's annual report noted in 1950, was several times greater than the price of a standard transmission outfit, replacement could only help the company.

The original contract with Ford in 1949 provided that Borg-Warner would make half of Ford's requirements, with Ford producing the other half itself under license. Initial quantities were limited, but had grown steadily with the favorable public reception to the "Ford-O-Matic."

Now the automaker expected to put it on most of its cars. With requirements potentially so large, Ford insisted that Borg-Warner would have to have at least two separate plants producing them, so

that two "sources" would still be available if anything happened to halt production at one.

Borg-Warner said it couldn't undertake that investment without some very important guarantees—a five-year contract, a minimum quantity, a guaranteed price. Ford agreed—on the condition that at the end of the five-year period, Borg-Warner give Ford Motor a paid-up, royalty-free license on its transmission patents.

Argument raged within Borg-Warner for months over whether or not to accept the terms. The virtues and dangers were both obvious.

For five years at least, the transmission business would be large and profitable. There was a chance that the arrangement would be continued at the end of the five years, especially if Borg-Warner could come up with further improvements.

There was also the manifest probability—since that was the way the automotive business generally worked—that at the end of the five years, with considerable plant and expertise invested in the making of its share of the transmissions, Ford would go its own way. The patent rights would be gone, Borg-Warner would have no leverage left, but would have two substantial plants without a product to make in them.

The contract meant a dilemma for both companies. Ford *needed* the Borg-Warner transmission. Both General Motors and Chrysler had their own. Ford, in the postwar years, had been so busy repairing its position in the marketing and styling race that it had not kept up adequately on some key engineering. In 1953, it still had no important automatic patents of its own, and none of the independents except Borg-Warner had anything nearly as good available. If the motor car company had tried to go ahead on its own immediately, the time, money and facility investment might have weakened it further in the competitive race.

For Borg-Warner, the situation was equally treacherous. If they said "no" to Ford, they had nowhere else to go with the product. If Ford should decide to go ahead on its own, even at high cost, Borg-Warner could do little to stop it. Ford had been making the transmission under license for three years, had some facilities in place, and might have begun to design around Borg-Warner patents. If Ford just went ahead and produced the transmission without a contract, it would have been difficult,

perhaps impossible, to stop them. By the time litigation had ended, the recoveries might not even cover the legal costs, much less the large profits that would have been lost.

So in 1953, Roy went ahead with the deal, knowing full well that it would probably end when the five years were up.

When the contract *was* ended five years later, a number of reasons were circulated. The two most common: Ford Motor was angry because Borg-Warner had refused to lower the price of the transmission; Henry Ford II was personally angry because Borg-Warner had made a cross-licensing agreement with General Motors that Ford felt reduced its edge in transmissions. Probably neither was important. The outcome—cancellation after five years—was expected from the beginning, and Ford and Borg-Warner remained friendly afterwards. Ford is still Borg-Warner's largest single customer today, accounting for approximately 10 per cent of total sales in 1977.

During the years the contract was in force, it represented a tremendous part of Borg-Warner business—as much, in some years, as 25 per cent of sales and 50 per cent of profits. It also stimulated the push to grow in other areas to fill the enormous gap when the contract ended.

A consensus already existed that Borg-Warner had to reduce its dependence on Detroit. Ingersoll, who had never really been an "auto-parts" man, liked the idea of expanding in other directions. From the beginning of his regime, he kept in his desk "a little list" of the industries he wanted to get into, and even the specific companies he wanted to acquire. The "industries" list was headed by oil-field equipment, air conditioning and construction—three areas Roy was convinced had the greatest growth potentials. The drilling business was still in the flush of its postwar boom. Theaters, other commercial installations and a very few residences had been getting "air-cooled" for 20 years, but less than 5 per cent of the potential had been scratched. Construction, particularly housing, was taking off, and the backlog was obviously huge.

Reflectal and Atkins Saw were already in the

house when Roy Ingersoll saw a possible lead into one of his "industries"—a sonic drill developed and patented by an acoustical scientist named Albert G. Bodine. Borg-Warner bought the development rights, outbidding two larger companies that also wanted it.

From Ingersoll's standpoint this was an ideal product for Borg-Warner. In theory, it was better than anything else available—it would drill anywhere from four to sixteen times faster than rotary drills, depending on the geological formation. It would involve the kind of engineering and metal working that Borg-Warner understood. It would provide entry to the big oilfield industry. It required work, but Ingersoll was prepared to spend the time and the money to make something of it.

Meanwhile, Norge remained a trouble spot.

Even though the mechanical problems with the refrigerator had been cleaned up—with at least one innovation, automatic defrost, added—the whole Norge operation was sagging badly. It had run up substantial operating losses in 1949, 1950 and 1951. Smith had helped stop the further degeneration of the distributor-dealer organization; with new styling and promotion, things seemed to be improving in 1952 for about six months, then fell apart again.

The board had been restive about Norge for years. In 1950, they told Ingersoll to get rid of it if the losses could not be stopped. In mid-1951, they ordered him to dispose of it. And in mid-1952 said it again. Ingersoll stalled. Norge was the only thing of any size that Borg-Warner had outside the automotive field. Instead he had gone looking for a new man to make something of Norge, and found him in Judson S. Sayre. Sayre had been the guiding genius behind the success of the Bendix washing machine line. He had recently quit Bendix and "retired" in his early fifties. It took more than a year to complete the negotiations with Sayre and bring him on board.

In another attempt to shore up the faltering Norge, Borg-Warner set up a new organization, B-W Acceptance Corp. Today, B-WAC ranks in the top 10 per cent of independent U.S. finance companies. At the time, its only function was to help stop the Norge dealer erosion by financing floor inventories of Norge products. Although it had the Borg-Warner initials in its name, it was expressly forbidden to use the full Borg-Warner name. The cross-identification

was not wanted with a strange new kind of operation that was considered more expedient than real.

Of more immediate importance, 1953 was the year that Marbon came out into the sun.

By now, Marbon had been carried for almost 20 years, not losing too much, but not contributing. Even with products useful to the war, its sales still had reached a high of only \$1.7 million by 1944, before peace knocked out most of the demand. After the war, it had developed some newer resins in the styrene family which were finding a small but mildly profitable market. Shattuck kept looking for something of greater potential.

Plastics were the obvious wave of the future, but Shattuck and his fellow chemists knew they could not compete with the giants in fields like polyethylene where the quantities would be very large.

They set out to work with a specific group of chemicals that theory said should result in an interesting product. Styrene was easily molded. Butadiene had many rubber-like characteristics and should reduce the brittleness that plagued many molded plastics of the time. Acrylonitrile provided surface hardness and resistance to chemical attack. Once they had zeroed in on the idea of a tough thermoplastic based on acrylonitrile, butadiene and styrene (ABS for short) the trick was to find the precise formula.

Before they came up with something that was considered good enough to have commercial possibilities, more than 2,000 different formulations were tested. Each of these formulations had further variations in the way the batches were made; actually more than 50,000 different syntheses of ABS materials were done before the final commercial approach was determined.

Marbon's product was not the first ABS to come to market—but it had a number of advantages over the others. It had a higher impact strength over a wider range of temperatures, was the most easily molded, and took color well.

It was called Cycolac—a name chosen not to identify or explain the product, but deliberately to confuse the competition. Many others were work-

Ingersoll and his metal-oriented board had no real feel for, or interest in, chemicals—but it was a new direction away from automotive, and potentially big.

ing to develop plastics with similar properties. The patent situation was confused. Shattuck hoped that even if he didn't wait for patents, it would take the competition a couple of years to duplicate his results.

The product was announced in mid-1953. Initial production capacity was about 4 million pounds a year.

Within a year, Cylolac had a customer that not only bought the product but helped to publicize it. RCA used Cylolac for its Impac radio cabinets, which it promoted dramatically with TV commercials showing a radio being dropped from a height with nary a dent or crack.

But Marbon and Cylolac still required faith, hope and assistance from Borg-Warner.

Ingersoll and his metal-oriented board had no real feel for, or interest in, chemicals—but it was a new direction away from automotive, and potentially big.

Borg-Warner provided \$10 million for a new plant that would have a capacity of 31 million pounds—more than 10 times the actual sales level of Cylolac ABS in 1955. By the time the plant actually went into production in 1957, Borg-Warner had put still another \$15 million into Marbon.

Cylolac ABS was never a single product. Its two standard grades were constantly modified to suit individual customer requirements. An enormous range of permutations was developed with varying degrees of rigidity, moldability, surface hardness, tensile strength and temperature range. One particular variation, called Cylolac T, became the largest single grade, and it had almost five years before competitive ABS materials with comparable qualities were available from rivals.

During this period, Marbon needed even more faith than in the early days, because the number of chips were growing. With all the different grades, with all the interesting applications, less than 8 million pounds were sold in 1958. The new plant was grossly under-utilized, and the division was operating at a loss.

The turnaround finally came in 1959.

Once telephones had come off the wall, they had become easily droppable—and breakable. After two years of testing to meet its rigid requirements, Western Electric had decided to make its phones from Cylolac ABS. Not only did Cylolac's high-

impact quality almost eliminate the phone breakage problem, but it could be molded faster, it was tougher and cheaper than competitive plastics, and it could be color-matched to Western Electric's standard colors. Within a year, Western Electric was making essentially all of its telephone housings from Cylolac ABS.

Marbon was on its way—after 25 years.

At the same time, Norge was coming alive again.

Sayre didn't come aboard actively until May, 1954. To get him, the company had to agree to a five-year contract with a salary believed to approach that of Roy Ingersoll himself—and the promise of a capital gain approaching \$1.5 million at the end of that time if he could actually make Norge profitable again.

Well before Sayre entered the picture, the company had been doing a number of things to get Norge moving. The plants had been recently expanded and modernized. B-W Acceptance Corp. was in place to help with the financing. The whole appliance line had already been redesigned, and was both attractive and technologically good. Except for the post-war refrigerator goof which had started Norge's slide, Borg-Warner had always known how to *make* good appliances. What nobody in Borg-Warner ever had known was how to *sell* them.

The whole consumer market—with its strange promotional requirements, and its serried ranks of distributors and dealers who had to be soothed and coaxed individually—was a never-never land to engineers used to dealing with a handful of industrial customers.

This world was Sayre's milieu. He was, first and foremost, a salesman, and a proven warrior in the consumer-goods battlefields. The Norge operation was shaken up rapidly—most of the old-line managers were replaced with eager young marketers that Sayre had come to know while at Bendix. Sales and promotion efforts were stepped up sharply. Sayre personally undertook the revamping of the distribution apparatus, lining up a complete set of new distributors and retail dealers who would actively push the Norge line.

Within six months, the results were visible. In the second half of 1954, sales were double those of the equivalent period the year before. In 1955, Norge sales climbed to \$129 million, triple those of 1953, the year before Sayre arrived. Now Norge again represented almost a quarter of the corporation's total volume, and it was all profitable business. Norge was back in the big leagues again, and still growing.

The decade of the Fifties was an active period for Borg-Warner. Not entirely successful, but active—and as a number of Ingersoll's colleagues still remember, a time of "fun."

For Roy Ingersoll was reaching out. One way was to buy into new businesses. The urge to "grow" had the additional goad of knowing that the company's biggest single contract would probably disappear by 1958.

The initial moves were cautious. Atkins Saw, for instance, involved very simple production technology, and its markets seemed to be expandable without great difficulty. Weston Hydraulics, bought in 1954 for \$1.5 million worth of Borg-Warner stock, was a small maker of hydraulic and pneumatic aircraft equipment that tied in with aircraft components made by Pesco. Primor Products was a small maker of air-conditioning systems that could be used with the furnace and air-conditioning combination that Ingersoll Products division had been trying to promote.

Then in 1955 and 1956, some big ones came along.

Ingersoll realized one of his dreams—getting into the oilfield supply and service business—when the Byron Jackson Co. became available. Borg-Warner acquired it for \$20 million in stock and another \$7.5 million in cash.

The largest part of Byron Jackson's business was industrial pumps. But what made Byron Jackson desirable for Borg-Warner was really its line of oilfield tools, which spelled growth and glamor to Ingersoll.

Shortly thereafter, in fact, Borg-Warner latched onto another—if much smaller—oilfield service company, Chemical Process Co., to supplement the Byron Jackson tool line. The sonic drill

was still being developed—Borg-Warner had poured about \$5 million into its development by this time—and the most recent tests looked quite promising. Ingersoll had visions of Borg-Warner's becoming a full-line oilfield company, supplying derrick equipment, drills, down-hole services, pipeline pumps and electronic controls. Even the timing seemed right when a later outbreak of hostilities in the Middle East spurred another increase in worldwide drilling.

The opportunity for Ingersoll's second "growth area" showed up the next year. Word came that York Corp., one of the three largest makers of air conditioning and industrial refrigeration, was up for sale.

Borg-Warner might have entered the air-conditioning business sooner. In the late Forties, Carrier Corp. had made overtures, but Davis and his automobile-oriented board were not interested, especially since they were having problems with Norge. In the early Fifties, Ingersoll had initiated an approach to Carrier and was rebuffed. York was also a big fish. Its sales were running around \$83 million, it had a strong name and many prestigious installations to its credit. According to some reports, the deal was pushed through so quickly that no inspection of the facilities were made at all until after the acquisition was completed.

A third leg of Borg-Warner's new growth was also put into place in 1956 with the acquisition of Humphryes Manufacturing Co., a sizable maker of cast iron and ceramic bathroom and kitchen fixtures.

Ingersoll had always wanted a piece of the construction business. Even before the war, at his Steel and Disc Division, he had been stamping out steel sinks and bathtubs, and had been offering prefabricated roof decking. The Utility Unit had represented a serious attempt to break into the field after the war. Now he was ready to tackle it again.

At the end of 1956, the Borg-Warner Builder Sales Division was announced. It offered builders "the first complete basement-to-roof package of home equipment, household appliances and building materials."

The "package" included the entire Norge line of appliances, York's air conditioning, Ingersoll-Humphryes kitchen and bathroom fixtures, supplementary plumbing supplies, Reflectal insulating

Borg-Warner seemed well on its way to its goal of freeing itself from dependence on the U.S. automobile industry and its cycles.

materials, KoolShade Window Screens (which kept out both glare and insects) and even a special-purpose lightweight concrete.

Certainly, as a result of the acquisitions, the mix had changed. The klatch of operations covered by the "builder's package" now represented almost 36 per cent of total Borg-Warner sales. Automotive sales were down to less than 33 per cent, compared to twice that proportion a couple of years earlier. The other 31 per cent included a miscellany of industrial, agricultural, and aviation and defense products—as well as two new areas, chemicals and petroleum services, that were expected to bring major growth. Borg-Warner seemed well on its way to its goal of freeing itself from dependence on the U.S. automobile industry and its cycles.

Moreover, it was headed in another direction—overseas.

Ingersoll was charging his divisions to "Grow!"—but the automotive divisions had already reached a practical limit in the United States. Improvements could be, and constantly were being, made in their specialized components, but at best that was a holding pattern. No matter what efforts a parts-producer made, no more or fewer cars would be produced. There was no practical way to break into other automotive component areas against the combined competition of existing entrenched parts-makers and the parts operations of the motor car companies themselves.

But the rest of the world was out there, waiting. Europe, and to a lesser degree the Orient, had automobile manufacturing industries of their own—but Borg-Warner felt that its patents, engineering and production techniques might give it an edge.

A lot of the balances were shifting as the decade wound down.

The fat revenues from the automatic transmission contract with Ford were gone after 1958. The company had developed an excellent smaller transmission which it sold to American Motors, but this work was small compared with the earlier volume. The automotive divisions generally were feeling the pressure of a drop in new car sales from the high levels of the early Fifties. Norge was soaring

again, and throwing off substantial profits. Marbon turned the corner into the black in 1959. B-W Acceptance Corp. was growing well enough that Borg-Warner was happy to acknowledge it.

The big new acquisitions were turning out to be terrific disappointments.

The oilfield Cinderella was less glamorous the morning after. Except for a spurt when Middle Eastern fighting spurred more exploration elsewhere for a short while, petroleum exploration steadily eased down for more than a decade. Some 3,000 rigs had been drilling for oil and gas around the world when Borg-Warner bought Byron Jackson; 10 years later only about 1,500 rigs were still working. The high hopes for the sonic drill had also blown away. The drilling end worked very well—but nobody was ever able to figure out how to prevent the counter-vibrations that the drill set up from shaking all the above-ground equipment to pieces.

If Byron Jackson was a disappointment, York was almost a disaster.

York was the oldest company in the air-conditioning and commercial refrigeration business, dating to before the turn of the century. When a theater was air conditioned for the first time, the Empire Theatre in Montgomery, Ala., in 1914, York had done it. Its big commercial and industrial air-conditioning systems had cooled the halls of Congress in Washington, scores of big buildings such as the Empire State in New York City, hotels, department stores and railroad trains. It had installed the first successful "single-room" air conditioner, and its ice cube makers were used in restaurants everywhere.

York was old in more ways than one.

The post-acquisition inspection came as a shock. Apparently, York's management had gotten tired enough to let many things slide. Much of the physical plant was seriously deteriorated, and operations were far from efficient. The operation needed a complete overhaul.

This was one of the very few acquisitions that Borg-Warner had made in which keeping the existing management was *not* part of the deal. Roy Ingersoll picked Henry Haase to run the new family

With the automotive industry, particularly, change was the only constant. It was almost literally a case of innovate or die.

addition. Haase had administered the Borg-Warner "experimental laboratory" for several years, then had come to headquarters as an administrative assistant to Roy. He had little production, engineering or sales background, but he had once worked for a small air-conditioning company. Haase's initial emphasis was to try to increase efficiency and cut costs. Nobody learned, until too late, that inadequately engineered and defective equipment was being shipped.

When the complaints and returns started coming in, Borg-Warner had no choice but to honor warranties, even though most of the defective work antedated the acquisition. Borg-Warner had put up \$50 million to get York; now it had to put in millions more—\$17 million in warranty losses alone, plus operating losses for nine years after the acquisition, plus further capital expenditures—to protect its investment.

In the half-dozen years following, York was turned inside out, in physical plant, in manufacturing techniques, in sales organization and in management. For the first time, corporate management was deeply involved in a division's activities from the beginning of the association. After all, the corporation was paying the bills. York would eventually become as autonomous as all the other divisions, but the early closeness with corporate headquarters would also continue.

One reason for the acquisition of York was, of course, the drive to get into non-automotive fields. Paradoxically, one of the things that saved York was a product that was not in the house at the time of acquisition, and that *was* automobile related. Borg-Warner found a line of automobile air-conditioning compressors made by Lehigh Manufacturing, bought it and turned it over to York. That compressor line was to go into most U.S. cars, and to be York's most solid money maker for years.

Most of the original entrepreneurs were gone by now, but their spirit of independence had been handed on to their successors. By the same token, the divisions understood that they retained independence only to the degree that they were effective. Each had to find its own customers. Borg-Warner

has never had any central marketing operations, even though many of its divisions sell to the same buyers. Each one had to develop its own products. The experimental laboratory had been replaced by the much more extensive Roy C. Ingersoll Research Center, but it was still charged with working only on developments that were *not* already in the province of the divisions. The markets that Borg-Warner divisions served were intensely competitive. With the automotive industry, particularly, change was the only constant. It was almost literally a case of innovate or die.

The system unquestionably made for fragmentation, for inadequate resources at each division, possibly for duplication. It was not always fruitful. One division spent more than four years perfecting a fuel-injection system. It worked beautifully—only, in the days when gasoline was still cheap, the public simply wouldn't pay the extra charge for the extra efficiency when a standard carburetor worked well enough for most purposes. The approach also had strengths. There was far less waste than might have been expected. Generally, division people were close enough to their customers to have a fairly good idea of what might be needed, wanted or accepted. Technological expertise was concentrated. The very fragmentation kept a flow of ideas coming from outside as well as inside; Borg-Warner divisions were a happy hunting ground for independent inventors who could get no hearing at the big integrated R & D establishments of many other large companies. Fresh ideas, uninhibited by existing procedures, could get exposure.

New developments poured out of the divisions constantly. Not all of them were successful. Few of them were glamorous. The consumer rarely heard of them, except perhaps indirectly in the promotional language of advertising for the products in which they were incorporated. But they had a great meaning to Borg-Warner's customers.

Here are just a few that made their debut during the frantic Fifties and early Sixties.

- A low-cost heavy-duty clutch for farm tractors. (Rockford Clutch)
- Hydraulic control systems for agricultural machinery. (Pesco)
- A new type of chain that permitted transmission of heavier loads at higher speeds. (Morse chain)

- Automatic defrosting for refrigerators and freezers. (Norge)
- Cylolac ABS in many variations. (Marbon)
- A new type of industrial torque convertor. (Long Manufacturing)
- A high-speed saw blade for cutting titanium and uranium (Atkins)
- Hydraulic actuators for remote controls in aircraft. (Weston Hydraulics)
- Mechanical power steering. (Warner Gear)
- One-way clutches for helicopters and military vehicles. (Spring)
- New types and sizes of universal joints. (Mechanics)
- Pumps designed specifically for extremely low and extremely high temperatures. (Byron Jackson Pump)
- A new fuel-injection system. (Marvel-Schebler)
- A spin-resistant automotive differential. (Warner Gear)
- A new line of oilfield tools. (Byron Jackson, Inc.)
- An air-conditioning system that could simultaneously heat one room and cool an adjoining room in the same structure. (York)
- An advanced heat pump. (York)
- A new submersible oil-well pump. (Byron Jackson Pump)
- A low-cost portable alternating current generator for remote locations. (Pesco)

Timing was vital. One had to stay constantly ahead of one's own customers. Unless the automakers and their customers were ready for it, a new development would be wrong for its time. On the other hand, if the need were obvious, then the odds were good that everybody—auto companies and other suppliers—were all working on the same idea.

Getting there first with the best—with patent protection if possible—made the difference.

Patentability was almost as vital as timing.

In the early days of Cylolac, Shattuck had gambled on going ahead without final patents. His gamble paid off. But the only way the edge was kept was to get patents quickly on all the Cylolac variations as they were created.

On the other hand, Borg-Warner actually perfected the first seat-belt retractors, just before seat

belts were made mandatory. But it hadn't gotten patent protection fast enough, and a swarm of competitors came out with cheaper copies.

Patents have always been a corporate responsibility, and one of the key strengths of the total organization. A patent attorney was one of the corporation's first employees. From the beginning, the patent department was one of the largest departments at headquarters.

By the end of the Fifties, Borg-Warner had already obtained more than 3,000 patents. In its 50-year history, the company has held well over 5,000. It still holds almost 1,700 active U.S. patents and twice as many foreign patents.

For significant products, a whole web of patents may be woven.

On a manual transmission, for example, the basic principle may go back 75 years or more, but improvements significant enough to patent continue to be developed—connections, ways of changing ratios, the way gears are synchronized. Borg-Warner's development engineers and patent attorneys try to keep alert to every possible change.

1961-71: Grow! Grow! But how?

By the time he was 73, Roy Ingersoll felt he had accomplished most of what he had wanted to do. He was ready to step down—sort of.

Roy was instinctively a dynasty builder. He had originally taken over Galesburg Coulter Disc from his father. When he ran the renamed Ingersoll Steel and Disc Division for Borg-Warner, he surrounded himself with two sons, two brothers and a brother-in-law. He had taken it for granted that a son would succeed him at the Ingersoll Division. When he became president of Borg-Warner, he assumed his son would succeed him in that post.

Robert Ingersoll had been his father's right arm since 1939. Originally he had handled Ingersoll Division's steel-making operation at Kalamazoo. During the war, he directed the division's production of amphibious vehicles. When Roy moved up to the corporation, Ingersoll Steel was divided in two, and Robert became president of the larger Ingersoll Products Division.

Three years later, Roy brought him to the corporate office—to help him as one of two administrative vice presidents. When Robert was named president in 1956, he was clearly heir-designate for the chief executive job. Roy officially relinquished the title of chief executive officer in favor of Robert two years later, but retained the office of Chairman.

A few days after the official changeover, one former senior officer recalls, Robert Ingersoll was presiding over his first staff meeting as chief executive when his father burst into the room shouting, "Bob, did you see this report from Blank Division? Now, I want you to go right down there and straighten them out!"

For the next three years, leadership at the top was fuzzy. Robert wanted to make changes; his father, still on the premises, managed to block most

of them, often not even deliberately.

"Even though I had the title," Robert Ingersoll says, "I didn't really become the chief executive in fact until 1961. Dad was such a strong person, such a dominant personality. It was difficult—no, it was impossible—for him to let go. I was the junior, and he was there physically. People just kept going to him for answers, and he couldn't back off."

Roy was finally, in 1961, persuaded by outside members of the board to step down, and Robert could move.

Bob Ingersoll was a new type at Borg-Warner. Neither a driver like his father nor a negotiator like Davis, he was probably a better manager than either one. Whether he would ever have sought to lead a major industrial organization on his own is a question that never can be answered. One long-time associate insists that Robert Ingersoll spent most of his life doing things he didn't want to do, and probably would have been happier in academe or some other more contemplative life. Nevertheless, Robert Ingersoll had been trained almost from birth to the world of business in general and Borg-Warner in particular, he had studied business administration at Yale, and he had been a consistent administrator from the time he joined the company.

The decade from 1961 to 1971, an era of major change and substantial growth for Borg-Warner, clearly carried Robert Ingersoll's stamp.

Some specific achievements of that period:

- Sales and earnings doubled. The billion-dollar mark was passed about halfway through.
- The corporation was reorganized in an effort to become a more coherent operating company.
- Marbon and its Cylolac ABS were to

become one of the great success stories of the era.

- B-WAC, no longer hidden behind initials only, became the Borg-Warner Acceptance Corp. as it climbed into the upper ranks of finance companies.
- The gap left by the ending of the Ford transmission contract was filled, and Borg-Warner became as strong a supplier to the automotive industry as ever.
- York was turned around to become once again a leader in air conditioning.
- International operations became a major factor in the company, growing at a faster rate than domestic operations.
- The tradition that the company acquired operations but never got rid of them was ended.

By the early Sixties, Borg-Warner had hundreds (by some ways of counting, thousands) of different products, and listed 47 divisions, subsidiaries and affiliates. Some of the weaker ones had been a drain for years. To Bob Ingersoll, there was obvious need to get rid of the losers.

The first operation to go, in 1966, was the one that had been Roy Ingersoll's first acquisition as Borg-Warner president—Atkins Saw. After 14 years of one of the most dynamic periods American business had known, Atkins sales were actually lower than when it was acquired.

The next obvious candidate for the block was Norge. The big appliance operation was roller-coastering back into trouble again.

Sayre had unquestionably rejuvenated Norge for a while. For five years, sales had grown steadily, outpacing the entire appliance industry. When a slump hit in 1960, he and his colleagues were working on another new concept.

Sayre had made his earlier reputation with the Bendix washing machine. That had become the brand most used in do-it-yourself "washing-machine stores" that sprang up across the country in the late Forties and Fifties.

Norge had its own top-quality line of clothes washers and dryers. The basic principles of a dry-

cleaning machine were not that different. Why not a do-it-yourself dry-cleaning-machine store?

Norge developed a small coin-operated machine, and early in 1961 began promoting its Norge Dry Cleaning and Laundry Villages. These were stores built around 8 to 16 dry-cleaning machines, and an equal number of conventional washers and dryers. Presumably a family could do all its clothing maintenance at once, at lower cost than commercial services. The Villages could be started with a relatively small investment, since liberal financing would be available. And, hopefully, Norge would sell a lot of cleaning and washing machines.

Norge originated the coin-operated dry cleaning machine, but the technology was not difficult. Within a few months of the first announcement, competitive models and self-service store plans were on the market.

Coin-operated dry-cleaning centers seemed to be an idea whose time had come. Several major companies were promoting the concept. Thousands of persons, many with limited business experience, rushed to buy in quickly.

By the end of 1961, there were more than 2,000 stores offering coin-operated dry cleaning, and Borg-Warner had equipped more of them than all the competition combined. One year later, the company declared that it had "equipped over a third of the nation's 7,300 outlets," and was moving the concept to Europe. By 1963 the only thing Borg-Warner was saying about the Villages was that "the division expects that the shakeout of investors in this market has run its course." The Villages were never mentioned again. Most of them had disappeared in another couple of years.

The crush of competition into a limited market hurt several companies. Norge, however, had made a deeper commitment, and lost more money. Barrons, a leading financial publication, estimated the loss at "a billion nickels." The figure was much lower, but on top of generally declining sales, it turned the division into another slide from which it never recovered.

Borg-Warner had carried Norge through several see-saws, but no more. Robert Ingersoll was introducing a new policy. Long-term commitment to an operation was a great ideal—but there had to be a justification for commitment. "If you can't be

among the top three in the appliance industry," says Ingersoll, "you shouldn't be in it at all." Norge was clearly never going to make the top three on its own. So Norge was put up for sale. The buyer, Fedders Corp., was a company that already knew its way around the consumer appliance market.

Internal reaction to the sale was surprising, Ingersoll recalls. Almost nobody in Borg-Warner outside Norge itself had ever felt comfortable with the consumer-oriented operation. It had been a strong bulwark for the company during the Depression, but had made a reasonable profit in only 10 of the 23 years since the end of the war. But it was the first real divestiture the company had ever had in its 40-year history, and emotions ran high. A surprising number of persons objected to *any* divestiture. "But getting rid of it," says Ingersoll, "gave us a chance to concentrate on other things that needed doing."

One of the things Bob Ingersoll thought needed doing from the very beginning of his administration was to reorganize the company. He was hardly unsympathetic to the autonomy tradition—he had grown up in it. "The real job at the top," he says, "is motivating people without interfering with their initiative, or without restraining them so much that you destroy their initiative." Ingersoll wanted to group the divisions more along business lines, and to set up group administrations through which vice presidents in charge would have responsibility for compatible industries—automotive, chemical, construction, industrial, etc. By 1964, his new group organization was in place, with groups headed by men who had previously run major divisions.

Attitudes started to change—slowly.

The new organization did not make any radical difference immediately. The divisions tended to regard the group vice presidents essentially as their ombudsman, their representatives at court. And the new group vice presidents tended to sympathize with that viewpoint.

Nevertheless, communication between divisions and corporate office improved in both directions. Almost for the first time, it became possible to find out what the divisions were doing ahead of time, rather than after the fact. The company had

had outside auditors from its inception, and had gotten into uniform accounting by the early Thirties, so corporate headquarters could always get the numbers. Now it was able to find out how the numbers were arrived at—and what "losers" among division products had been maintained and protected. A little more cooperation was growing among the divisions. In 1966, one division head described the "central office" as "our central bank, our patent office, and sometimes as our management consultant," but he derided the idea that the central office controlled his operation through the group structure. He conceded, however, that he was using more management consultant services from headquarters than ever before.

While reorganization was proceeding slowly, some of the operations were moving quickly. Marbon, for one, was going great.

Traditionally, Borg-Warner divisions innovated by first creating a product compatible with existing production and engineering capability, then trying to find a customer for it. Marbon was no different initially. In Cyclac ABS, it had simply created a product that had useful characteristics. Although RCA had given Cyclac early exposure with its TV demonstrations of the high-impact quality, customers did not flock in. ABS could theoretically replace a range of other materials, but a metal fabricator needed unusual persuasion to discard existing metal-forming machinery and re-equip himself for plastics. Even for those already working in plastics, ABS meant changing processing techniques.

Cyclac ABS faced substantial competition almost from the beginning. Companies like Monsanto and Uniroyal were also producing or developing ABS formulations. Both were larger than Borg-Warner in total, and larger than Marbon in plastics. The question was how to stay alive, no less ahead, in such a race.

Shattuck and his sales vice president, William Suiter, decided to try a strategy that was new to Borg-Warner. The first requirement was to find a market need, then to develop a special grade to meet it, then to demonstrate a specific applica-

Cyclac turned out to be one of the most versatile of all plastics to handle—it could be molded, extruded, vacuum-formed, even foamed.

tion for a specific customer.

The success of Cyclac plastic was to be as much a marketing story as a technical story. Suiter—who was later to become division president when Shattuck became a group vice president—had a gift for finding applications and for persuading customers to develop their own.

The breakthrough with Western Electric gave Cyclac industrial respectability and a substantial base of sales. Another early and big market was in women's shoes. Few plastics could withstand the constant pounding and flexing of the slender high heel of a woman's high-style shoe. A special Cyclac grade was developed specifically for such heels and accounted for millions of pounds of plastic.

Carmakers had been making limited use of plastics—about 22 pounds per car in 1960, most of that for decorative items. A decade later, plastic use per car was much greater, and almost 22 pounds was ABS alone.

Cyclac ABS got into cars on the basis of toughness, and Marbon took an increasingly greater share by devising special grades for specific parts of cars. Some parts needed to take high temperatures without deformation. Around headlights, for example, the constant buildup of heat thrown off by the lights could melt or distort many other plastics. Grills required a special grade that would take plating. ABS rapidly became the primary material for that use, with Cyclac holding half the market for the application. Marbon even built whole car bodies out of Cyclac ABS, and raced the vehicles in competition to prove the toughness, adaptability and low cost of its materials. It was later to persuade Citroen, the French auto producer, to build its jeep-like Mehari light utility vehicle with Cyclac body panels. That vehicle remained in commercial production for seven years.

Cyclac turned out to be one of the most versatile of all plastics to handle—it could be molded, extruded, vacuum-formed, even foamed. By finding new applications first, by creating new grades first, and by patenting them as quickly as possible, Marbon stayed well ahead of its rivals. It consistently held on to a full half of the total ABS market, while at least four competitors split the rest.

By the end of the Sixties, standard Cyclac

ABS grades were going not only into telephones, but also into camera and projector housings, appliances of all kinds, toys, business machines and automotive parts. High-impact grades were used for football helmets, boat hulls, luggage, power tools, furniture and automotive interior trim. High heat grades went into hair dryers and other electrical products. Flame retardant grades appeared in television cabinets, computer housings and electrical tools. Plated grades held the shine in auto grilles and wheel covers, plumbing fixtures and major appliance trim. Transparent grades were used in refrigerators, toys and medical accessories. Foam grades served where thick-walled sections, with great strength but light weight, were needed simultaneously.

As it grew, Marbon—which was to become Borg-Warner Chemicals Division—branched out. It integrated backward into producing its own styrene—the largest single component of ABS—with plants in Texas and Louisiana. It added resin plants in Illinois, Indiana and California. It moved to other countries, first Scotland, then Canada, Holland, Japan and Australia, the latter two in joint ventures with local companies.

It began to integrate forward into producing its own end-products; it bought two small pipe companies to produce ABS pipe for the construction market, and a specialty knitting company to make automotive and furniture fabrics from a special ABS-based material. Borg-Warner began producing outdoor signs and traffic cones, whole bodies for camper vehicles. It even began manufacturing and selling its own plastic molding and thermo-forming machinery.

The forward integration was too large a bite. The magic didn't carry over.

The idea had been to build the big items—like the campers—that fabricators of smaller parts couldn't afford or were hesitant to invest in. Consistent with the company's traditional philosophy, Marbon had been allowed to set its own directions, and had been provided with the funds to do so. However, with the newer philosophy developing under Robert Ingersoll, losers would no longer be carried indefinitely. Many fabricating operations were losers from their beginnings; after four years they were ended. Marbon went back to its successful niche as a resins developer and plastics supplier. Paradoxically, although Marbon's own end-

Throughout the Sixties, foreign automotive production grew at a faster rate than that of the United States, and Borg-Warner concentrated its physical expansion overseas.

products operations hadn't made it, they had helped prove how useful the material was in big items. Several manufacturers of boats and recreational vehicles have been making their consumer products out of Cycolac ABS ever since.

Marbon was not the only division to introduce overseas operations. Borg-Warner generally was expanding around the globe.

Borg-Warner had had some international exposure from its very inception. Morse Chain already had a satellite plant in England when it became part of the complex in 1929, and the international sales operation was started as early as 1934. Byron Jackson and York each had foreign plants when they were acquired, in Canada and England respectively.

It wasn't until the Fifties, however, that the international market was seen as a serious possibility. Borg-Warner's first new installation overseas was initiated when the company made a commitment to Ford Motor in 1953 to build a plant in England to supply Ford's European requirements for overdrives. By the time it was opened in 1958 at Letchworth, the new plant was substantially larger than originally planned. It involved an investment of over \$17 million, and was set up to produce not only overdrives, but a new line of small automatic transmissions for European cars.

During the Fifties, Borg and Beck had also opened a plant in Brazil to make clutches, and the corporation had acquired Coote & Jorgensen Ltd., one of the leading producers of automotive components in Australia. Australia then had a population smaller than New York State—but it had a thriving automotive industry that was maintained, perhaps chauvinistically, to meet Australia and New Zealand requirements for cars and trucks.

After Robert Ingersoll took over, international operations accelerated. Letchworth expanded, again and again. Borg-Warner transmissions or transmission components began to be made in either company-owned or joint-venture plants in Germany, Australia, Japan and Wales. York, already operating in England, embarked on joint ventures in France, Germany, Spain and

Japan. Byron Jackson had plants in the Netherlands and Mexico. Ingersoll Products opened plants in Argentina, Colombia, and Mexico. Marbon production facilities were located in Australia, Canada, Japan, the Netherlands and Scotland, with sales affiliates in France, Italy and England. Morse Chain expanded in England and Japan.

Throughout the Sixties, foreign automotive production grew at a faster rate than that of the United States, and Borg-Warner concentrated its physical expansion overseas. Fifteen of the company's 33 automotive products facilities were located outside the United States at the end of the decade. Automatic transmissions had been particularly successful—the versatile and proven Model 35 was being supplied to 30 different manufacturers for nearly 100 models of cars and trucks.

For the European market, Marbon added new lines of chemicals. Its biggest seller in that theater of operations was a related chemical, trademarked Blendex, used as a resin reinforcer with the clear vinyl used widely for packaging and bottling. York's engineered systems went into many of the major new construction projects on the Continent.

Within one decade, sales outside the United States rose from 6 per cent of the company's total in 1960 to 27 per cent of a much larger volume in 1970. In effect, while U.S. sales were increasing by a little less than half (though from a higher base), foreign business rose more than eight times.

Even B-WAC was eyeing the foreign market. The finance company had grown so well that it was ready to move overseas too.

For most of its first 10 years, Borg-Warner Acceptance Corp.'s life was relatively uneventful and mildly successful. It had been set up solely to help the faltering Norge, in the hope that more available financing would stem the outflow of dealers and distributors. The finance company did help Norge sales and the improvement in the appliance business kept B-WAC growing, slowly but steadily.

Its business was essentially confined to inventory financing. In effect, inventory financing allows a dealer, for an affordable interest charge, to

stock but not actually pay for his merchandise until it is sold to the retail buyers. The manufacturers are paid by the finance company when the order is delivered; the dealer pays the finance company as he sells. The finance company retains title to the merchandise until it is sold.

By 1962, the end of its first decade, B-WAC's net receivables had passed \$100 million, and its net earnings were over \$500,000, almost 10 times the level of five years earlier.

The corporate office was beginning to recognize B-WAC's usefulness as a selling tool. York's line of air-conditioning units presumably could use some of the same kind of help. So B-WAC was placed on its own as a full-fledged, albeit captive, finance company with its own lines of credit totaling \$35 million.

The bulk of its business remained Norge inventory financing, but it had begun to finance inventories in some other lines of appliances that its dealers also carried. As a further service, it was also handling some retail paper—that is, making installment loans to consumers for the purchase of the appliances.

Then came the Villages. B-WAC was still thought of, by its own people as well as by Norge and Borg-Warner personnel, as essentially part of the Norge sales operation. In the rush to get a major part of the market, the priority for Norge was to get as many locations open as quickly as possible. The finance company was heavily staffed with young men in their twenties who had started their work careers with B-WAC, and who were sometimes more concerned with helping Norge make a sale than with standard financial practices. So B-WAC became heavily involved in financing the Villages. When the do-it-yourself dry-cleaning bubble burst in 1963-64, B-WAC's earnings plummeted to the one loss in its history.

Borg-Warner's management had never been enthusiastic about owning a finance company. Appliances were strange enough, but at least they were something you *produced*. Finance was intangible—and Borg-Warner people had an instinctive revulsion to the idea of debt. At the time, its own total debt outstanding was under \$10 million, against assets of nearly half a billion. After the Village fiasco, Norge was on the block. No potential was seen for B-WAC as an independent operation, so

it was on the block too.

Until a disposition could be made, Ingersoll brought in two young men from the finance company's field offices, Robert LaRoche and Richard Doyle, to run it. Before a taker could be found, however, LaRoche and Doyle found a few solutions of their own.

When things started to slip at Norge, a number of its bright young men had jumped to other companies. Two of them, friends of LaRoche, had gone to Zenith Corp., and were moving up rapidly there. Through them, LaRoche got access to the Zenith dealer network—at a time when color TV was finally making its big move, and Zenith was one of the hottest companies in the field. Few dealers handled a single line of appliances, so other brands were soon being financed too. With a wider dealer network, the volume of consumer installment loans also rose.

With appliance financing solid, B-WAC went after the agricultural equipment market. There was no way a small company could compete head-on with the financial arms of giants like Deere and International Harvester. But LaRoche and his crew found some hundred smaller companies that made specialized equipment, and whose dealers could use the same kind of financial assistance as appliance dealers. Farmers have good years and bad years, but the equipment market is remarkably stable. Dealers are usually well established, with steady continuing relationships with their own customers—and financing is even more important in a bad year than a good one.

Some other growing industries were also characterized by a number of producers, most of them too small to have their own finance arms. Mobile homes, recreational vehicles and boats were typical—and superficially risky. B-WAC took the chance but protected itself through careful selection of companies, brands and individual dealers that it would finance. It established a solid and profitable position in wholesale and retail financing in all these fields. When Borg-Warner's appliance division was sold, Norge represented less than 5 per cent of B-WAC's business.

Inventory financing, with its accompanying retail installment opportunity, was to remain B-WAC's largest single area of operations, but in the latter half of the Sixties, it looked for wider fields.

B-WAC's success introduced Borg-Warner to a whole new world that its founders would never have understood at all, the "service" business.

Accounts receivable were next. To help a customer maintain a positive cash flow, B-WAC advanced funds—either purchasing their accounts receivables, the money owed the producer by his customers, or accepting them as security for a loan.

On a limited scale, B-WAC started making personal loans available directly to individuals in 1969.

That same year, it was to start the most complex and diversified of all its activities—leasing of capital equipment. The first ventures were in what may be the riskiest of all leasing areas—leasing TV sets and other equipment to motels and hotels. Soon the company branched out into a wide variety of leasing operations, from machinery to truck fleets to live cows (for dairy farmers)—even really large capital equipment such as locomotives and aircraft. Later it was to branch out into specialized credit insurance operations and esoteric forms of personal finance such as insurance premium financing.

The shock caused by the Villages upset turned out to be the best thing that could have happened to B-WAC. Since then, through a period of economic volatility that included two serious recessions, its own business and earnings have broken new records every single year without interruption.

More important for the long run, B-WAC's success introduced Borg-Warner, whose motto for so many years had been "Engineering and Production," to a whole new world that its founders would never have understood at all, the "service" business.

When he first took over, Robert Ingersoll was justifiably discouraged about his father's biggest acquisition. For years, the air-conditioning operation absorbed too much corporate money and time. The physical plant had to be extensively renovated. Technology needed to be upgraded, design improved. The division had to be reorganized in sensible pieces, and its sales operation rebuilt.

Responsibility for York was the hottest hot seat in the complex. Several managers came and went before Gerard V. Patrick took over for the longest stretch, the turnaround period from 1963 to 1969.

York's overall activities revolved around several different technical aspects of refrigeration.

For ordinary air conditioning, heat is being pumped from an indoor environment with a temperature range of approximately 65 to 90 degrees to an outside environment with a temperature range from 70 to 110 degrees. A room air conditioner is a fairly simple product. Requirements for a residence of seven to 15 rooms are larger but still relatively limited. For a hotel of 1,000 rooms, where temperatures must be kept even and comfortable simultaneously in bedrooms, active kitchens, vast lobbies and ballrooms where hundreds of bodies are generating heat, the equipment and systems become much more complex. Industrial refrigeration involves even wider parameters, because heat must be pumped from environments that may be as cold as liquid air to as hot as a large foundry.

York had always been a leader in the more complicated systems. Part of the warranty problem had been with one type of system for large commercial structures, but even through the most difficult days of the Fifties and early Sixties, York was able to get many of the world's most prestigious contracts. Some of them: the United Nations structures in Geneva; NASA's huge vehicle assembly structure at Merritt Island, which called for enough refrigeration to cool over 4,000 homes; the House of Lords of the British Parliament; the Mecca Conference Center in Saudi Arabia; the Paris Orly Airport; dozens of large hotels and office buildings in Chicago, Philadelphia, Detroit, London, Geneva, Singapore and New York, including the twin towers of the gargantuan World Trade Center which used enough cooling for 10,000 homes. Its industrial refrigeration systems were also being installed in factories around the world.

Where York had needed more strength was in "packaged" equipment, for rooms, homes, small commercial and industrial structures. The major emphasis on redesign and reorganization went to that aspect.

By 1964, the combination of the successful automotive compressor line, the big systems, and the improved packaged units was beginning to click. The division broke even that year, showed a definite profit the following year, and just kept going.

York had never been a major contender in the

room air conditioner segment of the business. It had to compete not only against the other specialists in air conditioning, but also with just about every appliance maker. General Electric, Westinghouse, RCA—even Norge—all made room units and had more efficient retail distribution than York could mount.

The residential market for central systems was a better opportunity.

York had never been able to make much headway with builders of new housing, particularly the large-scale development builders, even though one out of five new homes was being erected with central air conditioning installed. Nor was the York name too well known to consumers. But its redesigned and improved line included excellent add-on units that could be installed easily for any home that had existing ductwork.

Patrick tried a radical new approach—radical not only to Borg-Warner, but to the air-conditioning industry also.

Taking his cue from makers of cosmetics and small housewares, Patrick put crews of doorbell pushers on the street. York salesmen cold-canvassed door-to-door to show homeowners just how efficient, quiet and attractive the system could be in the specific home—and how easily and inexpensively it could be installed. The success of the campaign and the attention it gathered added a fillip to the merchandising through more conventional channels.

Other packaged systems—integrated self-contained units for small commercial and industrial operations that needed more cooling than a house, but not enough for a custom-engineered system—were the next line to make a major breakthrough.

International business—for both engineered and packaged systems—was growing even faster overseas than in the United States. The plant in England was considerably expanded, and during the Sixties joint venture or direct operations were started in six other countries.

By the time Robert Ingersoll stepped down, he had reason to be happier about York. The air-conditioning division's sales and earnings had improved for seven consecutive years. Its growth rate was higher than that of the corporation itself. It still had not overcome the lead of its two main rivals in the United States, but in Europe it had become

Number One in air conditioning and refrigeration, and was in a solid position everywhere.

The growth of the “new three”—Marbon, B-WAC and York—tended to obscure what was happening to the automotive operations. They were also doing quite well, thank you.

Transportation equipment still tended to cycle but was averaging a third of the total company's total sales and profits toward the end of the decade. Products were concentrated in the key transmission and drive components; markets were sufficiently spread to cushion against any single problem. Only 19 per cent of the business went to U.S. passenger cars; 18 per cent was for off-highway, agricultural and industrial equipment; 21 per cent went to the replacement parts market; and 36 per cent to foreign customers. The balance went to a miscellany of marine, military and other applications.

When Borg-Warner had started producing automatic transmissions in England for European cars, they were used almost exclusively for vehicles that were to be exported to the United States. It didn't take long, however, for European drivers to discover the convenience of automatics. Borg-Warner remained the largest independent producer of automatic transmissions, which were going into cars produced all around the world. In the United States, it was still making some automatics for American Motors, although that was to end with the 1973 model year. It was also the biggest independent producer of manual transmissions again, as American carmakers introduced more smaller cars into their lines.

During his administration, Robert Ingersoll had concentrated on managing what he inherited rather than reaching out to new fields. Not that he was uninterested in major acquisitions—just that Borg-Warner could no longer afford them. Borg-Warner was financially sound enough—the acquisition game itself had changed.

The Sixties were a time of frantic expansion by acquisition by many companies. The chips in this game were securities that traded at levels, in the words of Will Rogers, "that not only discounted the future, they discounted the hereafter." The stock of "growth" companies, some of whose growth was more accounting than real, were selling at anywhere from 20 to 40 times earnings.

Borg-Warner had paid a dividend every year since its inception; its growth was real; it was in good financial shape; it had a stable base and several operations with excellent future prospects. But the market was following flashier operations. Borg-Warner wasn't quite glamorous enough. Its stock, held back by Norge and other problems, just kept plodding along. Companies that might have been desirable marriage partners were just too expensive on those terms.

A formal record of the period still shows a great deal of activity. Officially, between 1961 and 1971, Borg-Warner made 22 acquisitions. However, all but two were quite small, most of them with assets under \$3 million. All of them were purchased primarily because they had a product or a development that complemented an existing line of one of the divisions. The largest of these acquisitions, Stephens-Adamson Manufacturing, was in an area new to Borg-Warner, bulk materials handling, but it was acquired primarily for its bearings operation as a complement to Morse Chain operations.

1972-78: Reaching for excellence

Robert Ingersoll left the company in 1972, when President Richard M. Nixon appointed him United States ambassador to Japan. Ingersoll had been exposed to Borg-Warner, through his family, almost since birth. He had been with the company actively for 33 years, more than a third of that time as its chief executive officer.

From the outside, there seemed to have been relatively little innovation during his regime. There were few products or activities in the complex when he left that had not been in place when he came to the top spot.

Nevertheless, he had made a number of changes that laid the groundwork for the company of the future. Through his establishment and insistent development of the group system, he initiated the processes that changed a very loose confederation of tribal chiefdoms, each largely going its own way, into the modern, coherent corporation that Borg-Warner has become. He cleaned up some trouble spots, began the elimination of many of the old laissez-faire traditions, introduced new controls, brought in new men.

But one of his major achievements was also the most intangible—he brought to the company a sense of integrity for both operations and personal attitudes.

For most of its first 30 years, Borg-Warner had operated on a fairly rough and tumble “make a profit today” basis, without worrying too much about the future. Profits counted, products counted, patents counted. People had a lower priority.

Ingersoll had worked hard to improve human relations within the company. He was an early, and serious, member of the Urban League, a strong believer in better racial relations. He was the bridge between the old attitude that an employee was liter-

ally nothing but a cents-per-hour cost and the current belief that the employee, at all levels, has an individual personality and individual rights.

When he interviewed someone for an upper-level job—whether an outsider or someone inside being considered for promotion—he often started the interview with a thoroughly unexpected question: “What is your philosophy of life?”

The question caught most interviewees flat-footed; many felt it was a trick to throw them off balance. Actually, Ingersoll really wanted to know—because he was looking for honesty and for a sense of dedication to company and customer, rather than for followers of the old tradition of “make a buck any way you can.”

And he was unquestionably a good steward. Most of the company’s activities were in better shape when he left than when he had become responsible for them a decade earlier.

Including an organization with succession ready. “I really felt free to take the ambassadorship,” he says, “only because Jim Beré was there, and I knew he could handle the job well.”

James F. Beré was another new kind of man for the top level of Borg-Warner. Davis had been a referee, a ringmaster coordinating a troupe of starring prima donnas. Roy Ingersoll, flamboyant and frenetic, was an operator. Robert Ingersoll had been more a trustee, conserving the asset. Beré was the company’s first professional manager, one with strong humanistic overtones, as keenly aware of a big company’s obligations to society in general as to its own stockholders. He was also the first chief executive with no personal connection to the “early days”—and probably the first one free to make decisions on a basis of company needs rather than company traditions.

By the time the company's 41st birthday rolled around, it was time to get organized.

Beré had started his career as a draftsman with the Clearing Machine Division of U.S. Industries, Inc. after he got out of college in 1946. In 1953, he had been made general manager of the division's plant in Hamilton, Ohio. Five years later he became president of USI's Axelson Manufacturing division, in Los Angeles. In 1961, Ingersoll invited him to join Borg-Warner. He started as president of Borg & Beck division. Three years later, he became group vice president for several of the automotive divisions. He was named an executive vice president in 1966, and president and chief operating officer two years later.

Beré's rapid move upward and election was something of a surprise to some in the organization. For one thing, he was a new boy—at least four other senior people had expected to become president on the retirement of Lester Porter.

Lester Porter, elected president when Ingersoll became chairman and chief executive officer, had been with the company even longer than Ingersoll, had come to headquarters ahead of him, had been made an administrative vice president at the same time. According to several colleagues close to both men, Porter was much closer to the division operating people than Ingersoll, and was not much interested in plans to strengthen the total corporation organization. Beré was radically different.

"Jim was my personal choice as my successor quite early," says Ingersoll. "We shared so many of the same ideas."

That they did. Both believed that the corporate organization had to be strengthened; both believed that Borg-Warner's human relations—something for which the company had never been noted—had to be improved. Both knew that profitless or static operations which were a drag on the company's progress had to be eliminated, regardless of tradition of sentiment. All of those shared ideas became Beré's responsibility.

For its first 40 years, Borg-Warner's history had been one of helter-skelter growth. Its sales had at least doubled every decade since its inception. During the Fifties and Sixties alone, Borg-Warner had acquired more than 40 different companies, large and small. It had expanded its operations to nearly

a score of countries on six continents. When the company joined the billion-dollar club in 1968, its annual report listed 70 "principal" divisions and subsidiaries, more than half of them outside the United States. A product list of the period would show hundreds of discrete items—thousands if all variations were included—being sold to scores of markets.

By the time the company's 41st birthday rolled around, it was time to get organized.

Every decade since the company was formed had been different. The Seventies also would be a period of massive transition. Sales and earnings would double once more. But most of the difference would be internal, and each step by itself sufficiently subtle that only when the total pictures were compared at the end of the decade could a difference be clearly seen.

Many of the changes started well before the Seventies, of course, but much of the shift in emphasis can be seen in what happened to James F. Beré during his first 17 years with Borg-Warner.

Beré was already a skilled manager when he joined Borg-Warner in 1961 as president of Borg & Beck Division. He was also one of the youngest, and one of the very few who had been brought in from outside the company, to start at that level. For three years he enjoyed all the advantages of running his own business as an effective and profitable operation.

His indoctrination into the higher realities of Borg-Warner started when he was appointed a group vice president, a job at that time that Beré compares to "pushing a wet noodle up a hill."

When Robert Ingersoll had become chief executive officer, he had tried to rationalize the whimsical administrative arrangement his father had established by at least grouping related operations under the jurisdiction of corporate vice presidents. But the division presidents had barely conceded any authority to the "central office." Another layer of authority was hardly acceptable.

Theoretically, group officers had responsibility for their divisions as profit centers, but actually had no authority to compel or stop activities that

would affect profits. Division managements tended to be self-perpetuating. Many of the division heads and their back-ups were in their sixties, and job replacements tended to be made more on a basis of friendship than merit. It was very difficult to fire a man, unless he was almost literally caught with his hand in the till.

Beré remembers that, as a new group vice president, he was quite often forced to wait in lobbies of division plants for long periods before he could see anybody—and the division people might still refuse to let him inspect their operations for fear he would tell someone else how they did things. One division president, whom he theoretically supervised, addressed him only as “kid.”

The job of “group officer” was complicated further by the dichotomy at the top of the corporation. Ingersoll and Porter were very different types, and rarely saw eye to eye. Porter tended to delay decisions, but when he made a commitment, it was set in concrete. Ingersoll was impatient. He wanted things done immediately, even though he might easily change his mind the next day.

When Porter didn’t move fast enough to suit Ingersoll, Bob often went direct to the group officer—who reported to Porter. And sometimes both Ingersoll and Porter would bypass the group man by going direct to the division head.

Beré had patience. He understood that building bridges to get understanding was more important than issuing edicts—which would not have been obeyed anyway. He accepted, of necessity, the fact that his primary activity would have to be representing, rather than controlling, the divisions.

But he did have some weapons. One was the approval of proposed expenditures. One division head flatly refused cooperation of any kind. Beré simply held up all authorizations for appropriations until the division head finally realized that unless more cooperation was forthcoming, no more money would be either.

Others were less standard. He forced away the veil of ignorance that most operating units tried to interpose between themselves and the corporate management by spending most of his time in the field, learning what the divisions did, what they wanted to accomplish—and who their main customers were. Then he committed what was for Borg-Warner a cardinal sin. He met with customers

without the division heads. In spite of the resulting uproar, Beré held firm. He agreed that he would not discuss pricing or operating details with customers, but he felt that he had to know the customers’ needs and perspective of Borg-Warner’s product and capability.

His next innovation created even greater furor.

In the mid-Sixties, no division knew very much about what other divisions were doing—aside, obviously, from the actual products that could be seen. In fact, until the late Sixties, division general managers saw no profit-and-loss information about other divisions and even the directors were given no return-on-investment figures for individual operating units.

Warner Gear often was cited as the big profit maker, without specifics. In fact, Warner Gear for so many years was the largest single profit producer in the entire complex, it was considered more than autonomous; it operated in effect as a totally independent company. On the outside, everything was consolidated—a tradition that tended to put a convenient blanket over operations.

As group vice president, Beré had access to the figures of the specific divisions in his group. So one day, he shattered all tradition. At a meeting of “his” division presidents, he announced to the entire group what each of them individually was doing, operationally and financially. The consternation was companywide, and Porter dressed him down sharply. The company survived the mild disclosure. It turned out, in fact, to be the forerunner of one of Borg-Warner’s best motivational devices—regular information to all key personnel on all key activities. Nobody wants to be known to be doing badly, and peer pressure became an influence for the first time.

Beré concedes that timing was in his favor. “Five years earlier,” he says, “and none of it could have been done, by me or anyone else.” In 1966, Beré was named an “executive vice president,” which in those days meant essentially someone in charge of a larger or more important group of divisions than a “group vice president.”

Still, almost no one considered the possibility of his becoming president when Lester Porter reached retirement age in 1968. True, Beré was one of three executive vice presidents—there were also

Beré had developed a reputation not only as a competent division and group executive, but also as a man willing to stick his neck out to try new approaches, unbound by tradition.

three “senior vice presidents” of equivalent or higher status—but he was only 45 and had barely seven years with Borg-Warner.

Beré himself had no reason to expect the job, although he admits to “occasional day-dreams for sometime in the future, of course.” Several other men were considered likely candidates, all of them capable, all with more experience with Borg-Warner.

As it turned out, Beré’s “lack of experience with the company” was one of his assets in getting the job.

For one thing, all the others in the running were Ingersoll’s age or older. Ingersoll felt that, for effective continuity, he should be backed up by a younger man, not one who would be due for retirement at the same time or even earlier than himself.

For another, although Beré had been with the company for a relatively short time—the other contenders averaged 25 years—he had developed a reputation not only as a competent division and group executive, but also as a man willing to stick his neck out to try new approaches, unbound by tradition.

To Ingersoll, who had been battling for a decade to make changes, against both inertia and active resistance, that may have been the most important of all.

Ingersoll personally sold his board of directors on Beré—but Beré was also lucky in his colleagues.

A few of the other contenders sincerely believed that they had been “promised” the presidential spot. When the new boy was picked over their heads, they could have, collectively or individually, sabotaged his effectiveness without too much difficulty. One man did resign. But all the others—who had both the experience and the respect of the organization—stayed and gave Beré the immediate and continuing loyalty and support that made it possible for him to do the job.

Beré and Bob Ingersoll made an excellent team. The dichotomy at headquarters—with a chairman and a president pointing in opposite directions, and everybody aware of it—was ended.

The two men frequently disagreed on tactics, rarely did so on concept or philosophy.

But they meshed in some unusual ways.

When Beré became president, Ingersoll made it clear that he, Ingersoll, was to be “Mr. Outside”—that is, handle long-range strategy, policy, financial and socio-political issues, make the public appearances and speak for the company. Beré was to be “Mr. Inside,” and direct the actual day-to-day operations. It didn’t work out that simply.

Beré had made his initial reputation as an operating man, but it was not really his strong point. He had never had the necessary liking or patience for the myriad of details or for the dozens of pesky little decisions required in daily operations. Ingersoll, on the other hand, consistently involved himself in even minor details of day-to-day division affairs; he was relatively uninterested in long-term matters, and passed more and more strategic responsibility to Jim Beré. Ingersoll remained unequivocally the Boss until he left, but the two men worked out a *modus vivendi* that became almost an unconscious role reversal—which, if anything, made their working relationship even stronger.

Certainly there was no disagreement on the need for changes.

Step number one was to find out more precisely just what the company was made up of. To get an effective inventory, the financial accounting systems would have to be refined and improved. The right man came along for that job in 1968 also, when Ingersoll found and hired James J. Gavin, Jr. away from Indian Head Corp. to be his new vice president, finance.

Theoretically, accounting had been standardized since the mid-Thirties. Actually, few divisions were identical in the ways they handled overhead, inventories, receivables. Profit and loss statements were based on total division operations. Some divisions made only one or two products, some made dozens. Annual sales of a division might be anywhere from less than \$1 million up to \$100 million. One single, highly profitable product could hold an umbrella over a half-dozen unprofitable ones. There was no real way for anyone at corporate headquarters to know until Gavin established new and more sophisticated systems of fis-

cal reporting and control.

The new analyses started comparing apples with apples, and made it possible, for the first time, to find out what was happening with individual products.

Dozens of products were found to be outright losers, and even more were marginal at best. Only a handful of operating divisions were actually doing well.

Few of the acquisitions of the Fifties and Sixties were pulling any weight. At York, the losses were ended, but the profits were still slim. Byron Jackson had been divided into two divisions, one for oilfield tools and services and one for industrial and utility pumps, but both were drifting. Plumbing products were going nowhere. B-WAC was beginning to look interesting, but wasn't throwing off much cash yet. Marbon, while still growing, had some problems of its own. The rapid expansion of foreign operations was causing more outgo than income.

Transportation equipment remained very profitable, even though actual amounts tended to vary as the fortunes of the automobile business itself fluctuated. Several of the automotive divisions were moving increasingly into equipment for trucks, off-the-road and agricultural equipment, which were slightly less cyclical than automobiles.

During the early Sixties, when Norge and York were both losing heavily, domestic transmissions had been the great bulwark, accounting for 56 per cent of the company's total pre-tax earnings in 1962. The ending of the Ford contract had sharply reduced the automatic transmission business—but shortly afterward it was partly offset by automatics produced for American Motors, and then the "muscle cars" with manual transmissions became surprisingly fashionable. All of the Big Three had taken over production of their own automatics, but Borg-Warner suddenly had a large, and unexpected, market as the leading independent producer of transmissions. Even though volume drifted down through the Sixties, automatic and manual transmissions still accounted for about one-fifth of pre-tax profits in 1968.

On the surface, the company was in good shape. 1968 earnings were a record, and 1969 figures reached still another new high.

Records or not, the rates of return on both

sales and investment were below the median for American industry. That wasn't good enough. And it was increasingly clear to Borg-Warner's top management that if some things weren't changed, future directions might well be down rather than up.

One aspect of the changed philosophy became dramatically visible in 1970, when some of the company's newest operations were abruptly ended.

Only about five years earlier, Marbon had begun branching into a variety of fabricating operations: recreational vehicles, pipe, highway signs, woven plastic fabrics, even machinery. Most of these operations were still losing money. That in itself was not surprising. An industrial company rarely expects to make profits on a new operation immediately. Besides, Borg-Warner had traditionally carried operations for years until they established themselves.

But now the rules were changing. The question asked by the corporate office was not, "When will these new operations make a profit?," but rather, "Should we be in the plastics fabricating business at all?"

The answer was no.

As a supplier of plastic resins and related chemicals, Borg-Warner filled a major niche; as a fabricator, it would be one of hundreds, most of them entrepreneurial specialists. Beré studied what had happened in other materials industries, even such large ones as steel. He found that, in too many cases, suppliers had gotten into trouble when they went into forward integration. In all its other production areas, Borg-Warner bought the raw materials, turned them into products. But in plastics, the decision was that Borg-Warner would remain the material supplier—continuing to think up new applications, to be sure, persuading others to try them, but leaving the actual consumer marketing to others.

This was a more radical departure than the Norge decision just two years earlier. With Norge there had really been almost no choice left. This was the first time, however, that any disposition had been made as a matter of principle. In fact, it was a fairly expensive principle. Eliminating all the

The keystone of a new five-year plan announced in 1971 was the elimination of operations and products that were either unprofitable or held little promise of growth.

plastics-fabricating operations cost a pre-tax writeoff of about \$30 million.

Ingersoll was willing to bite the bullet and take the loss in order to establish the principle. A lot more stripping down was to come.

The next year, the precedent was formalized. The keystone of a new five-year plan announced in 1971 was the elimination of operations and products that were either unprofitable or held little promise of growth.

New accounting and administrative procedures were making possible a genuine inventory of the company's operations. Borg-Warner had taken great pride in its diversity and complexity for years, and had made a point in annual reports and other published material of the large number of divisions and products. "But all in all," says Beré, "it was a motley collection. We had to decide first what markets we even wanted to stay in—and in which of those we could achieve a viable size."

The decision was made to strip down to five basic businesses—transportation equipment, industrial equipment, chemicals and plastics, air conditioning and financial services. All had a solid base within the company. Even though most were in relatively "mature" industries, all had potential for further growth. Operations and products outside those categories—and even within them if they were unprofitable or marginal—became candidates for elimination.

Between 1968 and 1975, operations with at least a third of a billion dollars in annual sales (including Norge) were disposed of. That included many of the companies acquired during the Fifties and Sixties. Still Borg-Warner's annual sales increased by some 60 per cent over those seven years.

Among the first to go were the aerospace operations. Ever since the end of World War II, Borg-Warner had been doggedly trying to find a place for itself in aerospace, but after 25 years, it was still selling only about \$45 million annually to that market through three small divisions, against competitors 10 and 20 times as large. There was no way Borg-Warner could build either the technological or

the political apparatus necessary for viability in the complex defense business.

The Byron Jackson oilfield supply and service business was in a somewhat different situation. Roy Ingersoll's dream of becoming a major factor in the oilfield business had never come near being fulfilled. Byron Jackson Inc. had been mildly profitable, moving along with its drilling industry market, which was itself in the doldrums throughout the Sixties. In the Seventies, the business was beginning to pick up.

Nevertheless, survival for the supply and service unit would have required acquisition of enough other complementary oilfield specialist businesses to create a truly competitive entity. Beré liked the energy field, but Borg-Warner simply could not afford the kind of acquisition binge that would be necessary. Borg-Warner's own stock was selling at a below-average multiple, while most other oilfield supply and service companies were selling at above-average multiples.

So Beré decided to trade Byron Jackson Inc. for a different kind of participation in the energy business. BJ Inc. was sold in 1973 to Hughes Tool, one of the leaders—and probably the most aggressive merchandiser—in the oilfield supply business, in exchange for an effective 20 per cent share of Hughes' equity.

The next big piece to go was one that had been acquired only five years earlier—the bulk conveyor business of Stephens-Adamson. That company had been purchased essentially for its bearings business, which was retained. Borg-Warner had initially thought it could make gains with bulk materials handling too—theoretically it was experienced in big engineering projects for industrial companies through York—but it never really felt comfortable with contract systems.

A lot of large chunks of Borg-Warner were going rather quickly, although it didn't always seem that way to people anxious to get this phase over with. Many of the dispositions probably could have been made faster. But Beré felt strongly that the Borg-Warner people in the properties should have as much information and protection as possible. In the Norge disposal, its people hadn't been adequately protected—and many had been hurt. Afterwards, an effort was always made to find buyers that would keep a unit as intact as possible.

Almost without exception, the companies that bought the companies Borg-Warner sold had greater success with them than had Borg-Warner—primarily because they fit with the methods and markets of the buyers better than they had under Borg-Warner. With the careful sales procedures, everybody gained. New owners acquired good operations, employees got reasonable protection, and Borg-Warner recovered assets it could deploy more effectively elsewhere.

Possibly the most unusual disposition was that of the steel group, three smallish plants with combined sales of around \$75 million. One had been part of the personal fiefdom of the Ingersolls, and the other two were acquired later out of Roy's continuing faith in the steel industry.

The steel operations had never had much to do with the rest of Borg-Warner. Other divisions used a lot of steel, but not the kind of specialties made by these plants—mostly light agricultural and construction shapes, and stainless plate. But for most of their history, the steel divisions had been extremely profitable, showing among the highest returns on investment of any operations in the house.

That picture changed in the Sixties. The United States had been a steel exporter for generations; now imports were creating severe strains. Because of the tighter competition, Borg-Warner tried to update and expand its own mills, adding continuous and pressure casting and improved rolling facilities. The new technology added more charges than profits. The plants individually were still viable—but under the new guidelines, there was no real place for them.

Finding a buyer was something else; by the early Seventies every major steel company in the country was under pressure and even some of the largest were cutting back operations. Borg-Warner made an offer to a surprising prospective buyer—the managers of its own steel operations.

Béré had always felt that employees should have a stake in what they do. Almost everyone else felt it would be throwing lambs to the wolves. Béré persisted, however. A financial package was put together with enough safeguards to keep the new company from going bankrupt.

The new owners had the virtue of knowing their own plants and markets. They did exactly,

on their own, what Béré was trying to do with Borg-Warner. They stopped expansion moves, cut out marginal products and operations, concentrated on profitable products for specialized regional markets and broke into the black in 1978.

In between the major dispositions, there were smaller ones. Some had been small companies, picked up from time to time for various reasons, that had never gone anywhere under the Borg-Warner umbrella either. In other cases they were product lines that had long been losers, but sentimentally protected under the cover of consolidated statements. One automotive division, for instance, dropped over 100 "sub-marginal" products from its lines.

If the continuous inventory of operations was pointing up the situations, large and small, that Borg-Warner could do without, it was also pointing up the situations that had to be improved even if they were to be retained.

York was one. Air conditioning was one of the five businesses in which Borg-Warner intended to remain. At the beginning of the Seventies, York was looking relatively good. Relative, that is, to the string of loss years after the acquisition. Its earnings had been increasing for four or five years, but the returns were still, by most business standards, only mediocre.

One York problem that had been partially fixed during the Sixties was that of distribution. The company had always worked directly with "retailers," while its competition had early gone to wholesale distribution. In a major city, for instance, Carrier's wholesale distributor might have a dozen or more contractors pushing its residential central air-conditioning system. York would be working with a single contractor in that same city. Joe Elliott and Gerry Patrick had revamped distribution with more wholesalers, one of the factors in the turnaround of the division. Now, under a new division president, Jack Kennedy, York set out to improve both the distribution and the product further.

Around 1970, the division once more started to redesign its "unitary" lines—packaged equipment for central air conditioning of homes and

York's new heat pump was extremely efficient—it could turn out at least twice as much energy in thermal units as it used in electricity.

small commercial and industrial operations. The distributor organization was tightened and expanded—and in bigger markets York even opened its own “factory branches.” Between 1972 and 1977, volume on “unitary” trebled, finally exceeding the engineered systems—which had also opened more sales offices and increased its volume.

Added impetus came from a new heat-pump system.

A heat pump is a single unit that can either heat or cool. In midwinter, it can take heat from outdoor air even at very low temperatures to warm the interior of a structure. In summer, it cools the inside by reversing its flow.

The theory had been known for years, and commercial models had been on the market a generation earlier. But they didn't always work right. With energy relatively cheap, consumers preferred more conventional separate heating and air-conditioning systems.

York's new design eliminated the old reliability problems. More important, the new version was extremely efficient—it could turn out at least twice as much energy in thermal units as it used in electricity. With shortages and escalating costs, lower total energy consumption had new appeal. Heat pumps became the fastest-growing single segment of York operations.

For almost two decades York had been the leading independent producer of compressors for automotive air conditioners. With cars getting smaller, however, the old reliable was too bulky. York developed a new rotary compressor that is smaller, lighter and even more efficient. York has increasingly shifted its mechanical products to electronic controls. Special and precise microprocessor techniques help the large-structure systems to meet a variety of conditions, saving more energy and cooling better.

Operations were also revamped in another way, one that would be paralleled in other divisions.

Decentralization and autonomy had been almost a religion with Borg-Warner from its birth. But it was never really carried to its logical conclusion. While every division head insisted rigidly on his own personal autonomy, rarely was that extended downward to departments within a division. With multiple products, an ostensibly weak one could be in trouble solely because it wasn't

getting the proper support. A mechanism was needed to clarify and individualize the various businesses within the division itself.

The answer, paradoxically, was more decentralization.

Larger divisions were subdivided into smaller parts, so that each could become visible—and by having to stand alone, prove what it could do. At York, automotive compressors, “packaged” units, engineered systems for large structures, heavy machinery for industrial refrigeration all required different production and marketing methods.

When they were separated out, the strengths and weaknesses of each were clearly visible. Individuals who had been obscured in the shadow of the larger organization responded well to the challenge of greater responsibility and greater authority.

A quick look at a 10-year financial table shows a consistent upward movement for Borg-Warner during the Seventies. Just from Beré's first full year as chief executive in 1972 to the end of the 50th anniversary year in 1978, sales and earnings more than doubled. But the period was not as smooth as it might seem.

Ingersoll and Beré each had problems during his first three years as CEO. Bob Ingersoll had been blocked by his father, and prevented from doing enough. Beré ran into difficulty because he tried to do too much—and simultaneously, in some ways, not enough.

For three years after Ingersoll left, Beré kept the title of president and chief executive officer. He had come up as an operating man, had picked up some of the policy/strategy reins under Ingersoll. Now that he was CEO, he tried to do—alone—both the strategic and the operating jobs, even though the company was becoming increasingly larger and more complex. It was, he says, a tough time. He had executive vice presidents, to be sure—four of them in 1972, three in 1973, only one in 1974. These executive vice presidents, however, were actually group executives—none was an across-the-board Number Two to Beré.

As CEO, his strongest interests were policy

and strategy. He was quite concerned about improving humanistic attitudes and communication throughout the company. And he tended more and more to leave much of the operating direction to his group executives.

It seemed to be working fine for two years. With momentum and a strong economy, sales and earnings were continuing to rise.

Then came 1974.

Earnings plummeted. Physical volume was down—only inflation was making total volume look higher. Debt had jumped a whopping 73 per cent in three years, and in the latter part of 1974 was increasing by \$5 million a month, twice the profit rate. Inventories were being swollen by panic buying. It was suddenly obvious that things had been drifting—that too many people at lower levels were scattering without clear-enough direction.

A new fiscal reporting system had been introduced earlier, true—but, says one senior official: “You can’t control a company with systems. People have to control. If they don’t, the systems hardly matter.”

And people weren’t controlling. Beré concedes that much of that “people problem” was his own fault.

In the early days, Beré says, “I moved a little too fast in putting new people into responsible positions.” While he was still chief operating officer, he had made a number of personnel changes, and it was these men he was relying on when he moved into the Number One spot.

In one case, a man brought in from a highly-structured outside company never quite adapted to Borg-Warner’s informal, no-directive, decentralized system. At another major group, a new “outsider” initiated a number of important and needed changes—but he tried to do everything at once and too fast, and conflict developed within the group. In still other cases, veteran Borg-Warner men who had done good jobs at divisions were turning out to be far less effective as group executives.

But if Beré had moved too fast in putting people into place, he had perhaps too much patience if they weren’t working out well. In his earlier days, Beré hated to fire anyone. Sometimes, even when he was convinced that a change was advisable, he tended to put off the unpleasant chore.

The 1974 debacle changed that. Beré learned

—fast—to come to grips with his own tendencies. He still believed in patience, in giving a man enough time to prove himself, but when people changes became necessary, they were made.

The situation also forced him to recognize that he needed more help at the top—that if he wanted to concentrate on the strategic job, he needed someone who could take firm charge of operations.

In 1975, he picked Robert O. Bass as his new president and chief operating officer, while he took the title of chairman and chief executive officer.

Bass was a solid operating man. He had been “acquired” by Borg-Warner almost two decades earlier, along with the company he headed, Eberhardt-Denver. He had had 10 years as president of a key division, had spent most of another decade successively running two major groups, and was respected throughout the company.

Bob Bass began his career, immediately after graduating from high school in 1934, as a laborer in a local machine shop that was to become Eberhardt-Denver, a recognized maker of speed reducers. He worked his way through college at night while working his way up by day to co-ownership in the company. After Borg-Warner acquired it in 1956, Bass stayed in Denver to run the 150-man shop for only a few months before he was asked to take over as operating manager of Morse Chain—which was badly in need of some assistance.

Bass, who was in many ways cast in the entrepreneurial mold of Borg-Warner’s founders, was a little wary. He was used to running his own shop in Denver, was concerned about being lost in the much bigger Borg-Warner organization. He accepted the assignment only after being assured that at Morse “he would get no interference from Chicago—and no help either.”

Morse, of course, had been one of the “originals” in Borg-Warner. In addition to the traditional autonomy, its location in Ithaca, N.Y., was so inconvenient to get to that it was almost entirely ignored by headquarters. Its products had good reputations, and its reported numbers looked adequate.

It wasn’t till around 1955 that anybody at the

A new kind of chain, the Hy-Vo, was developed that could run fast, silently and almost forever.

corporate office realized that the "Fund Syndrome" had struck again.

Morse's numbers had looked good because its management was holding volume up by selling to a handful of big customers at cut rates, and making it look profitable by letting everything else—product development, marketing, facilities—slide in order to keep annual bonuses high.

Morse had managed to keep the special manufacturing skills that had made its original reputation. But otherwise, the operation had to be largely rebuilt: new products designed, sales and marketing organizations developed from scratch, its physical facilities, some of which dated back to the 19th Century, renovated and expanded.

It took Bass, he says, "almost 10 years to make Morse a company to be proud of again." By 1966, Morse had become, and has remained, one of the jewels of the empire. A new kind of chain, the Hy-Vo, was developed that could run fast, silently and almost forever. The division drove to the top position in the industrial/automotive chain industry while adding a range of other power transmission products.

In 1966, Bass was promoted to group vice president of the Industrial Equipment Group. In addition to Morse, the group included the Byron Jackson pump and oilfield divisions, Ingersoll Products, and three other divisions that sold mainly to the aerospace industry.

Bass had never lost his original entrepreneurial tastes, and he had had a decade of autonomy at Morse. But, like Beré, he felt that an effective group organization was essential to the continuing success of Borg-Warner—and he made group administration work more effectively than most of his peers. Except for Morse, almost every operation he supervised was in the doldrums when he became group vice president. Some of them were to be disposed of later, but within two years, all of them had been sufficiently stimulated so that Bass' title was upgraded to executive vice president in charge of the now resurgent Industrial Products Group.

In 1973, he was handed perhaps the thorniest assignment in the company when he was named executive vice president—and a year later, president—of a new Transportation Equipment Group. This included all operations directly serving the automotive industry—even the previously "most auto-

mous" transmission operations—and represented more than 40 per cent of Borg-Warner's total business. He was the key mover in the overall reorganization of automotive operations that, for the first time in almost half a century, resulted in an effective recombination of the talents and facilities of the several divisions for the benefit of the entire group.

When the time came in 1975, he was the obvious choice for chief operating officer.

The shock of the 1974-1975 turndown created a number of salutary effects.

First, it established a smoothly-working team at the top: Beré as CEO and strategist, Bass with a firm hand on operations, and Gavin supplying sophisticated financial direction.

Second, it forced a tightening of controls at all levels, a more careful attention to costs, production methods and pricing in order to improve the overall returns that were still running below industry averages. Within one year, debt was reduced by 40 per cent, inventories and receivables improved sharply.

And third, it set the basis for another new attitude throughout the company.

In the early Seventies, the company was becoming a much more unified entity, but operating managers were primarily expected to handle their day-to-day operations efficiently enough to be profitable. Normally they had neither the requirement nor the time for philosophical questioning as to whether what they did should be done at all. That question belonged to "somebody upstairs."

Even top management had never given serious thought to that question until almost the beginning of the Seventies. The divestment program was one result—but it applied only to the more obvious weak spots. In a company of Borg-Warner's complexity, no headquarters task force could make analyses and determinations about literally hundreds of different products going to scores of markets.

In 1975, Borg-Warner introduced a strategic planning system that went down past the division level all the way to individual product areas. The

operating manager now had to ask himself hard questions: "What business am I really in?" "What future does that business have?" "What share of it can I really get?" "Should we be in it at all?"

Headquarters recognized that operating level analyses had to be somewhat myopic—it would be a rare man who could say impersonally that the work he did for a living had little future. But under a new "entity concept" every group and, in fact, every operating unit, had to look at itself as a complete and separate entity. Would it be able on its own to attract in the free market the same capital it was requesting from Borg-Warner? Could it even survive, much less grow, were it truly independent? The discipline of such self-examination forced groups and divisions to make their own hard decisions about how to allocate their resources to the areas providing or promising the best return.

The process also established a framework of disciplined communication which began to make a better connection between policy planning at the top and what was actually happening at the division level. And for the first time, it gave the operating people clearer goals to shoot at than just next week, next month, or, at most, next year.

Paradoxically, one of the major problems in creating new attitudes was to teach operating people to think like entrepreneurs again.

The Borg-Warner autonomy system had developed because all its original "managers" had previously been the actual owners before they joined the complex. Most of them had built their own businesses, and continued to run them within Borg-Warner as if they were still their own.

As the generations changed, the still-autonomous division managers became more and more administrators. Since the corporation supplied the needed money and the leverage, often without asking too many questions, there was less and less inducement to innovate beyond product improvement.

"The 'success syndrome,'" says Gavin, "had been one of the biggest hazards in getting attitudes changed. No matter how markets, technology, the whole world, changed, the tendency was to continue doing what had worked so far. You need good professional administration—but that doesn't make things happen. Business needs people with guts, who will stick their necks out. We still need the

entrepreneur. We look for the man who can make things happen."

That's where strategic planning—with its emphasis on controlled change in the organization, and allocation of resources to the strongest operations—became a powerful tool.

Units still could do their own thing—but no more did the company, as a former officer was fond of saying, "whip the winners and spoon-feed the losers." Stability was no longer enough. Under the new guidelines, major allocations go only to areas where the action is.

Some of the ways Borg-Warner changed in its most recent decade can be traced in a single division, Byron Jackson Pumps.

Byron Jackson, which had been acquired in 1955 mainly for its oilfield operations, was split a few years later into two divisions, one concentrating on oilfield tools and services, and the other on a wide line of industrial pumps.

BJ pumps controlled the water at giant dams like Grand Coulee. In the petroleum industry Byron Jackson had international stature for pipeline and refinery pumps. In the late Sixties, it was making a new kind of submersible pump, called "Centrilift." These specialties, as little as 4.5 inches in diameter and as much as 150 feet long, could be dropped two miles down a drill pipe to force up oil by increasing the pressure on it. BJ also had been making specialty pumps for nuclear applications since the beginning of the nuclear age.

For more than a decade, nobody in Borg-Warner paid much attention to Byron Jackson Pump as it just chugged along, not making much money, not losing much, not bothering anybody. Yet it was, with justification, proud of its work—it took on the tough ones that nobody else really wanted to tackle.

For instance, it was definitely a leader in the very demanding nuclear field. These pumps had to work without fail at the outer limits of tolerance and temperature. A detailed stress analysis had to be made of every part. Every single casting had to be X-rayed. Welding rod had to be kept in vaults to prevent possible contamination. The nuclear work

By the end of 1976, most of the objectives postulated at the beginning of the decade had been achieved.

was difficult, challenging, glamorous, and satisfying.

But it wasn't very profitable—and the magnitude of the required effort tended to detract from all the other areas. Except for the new Centrilift pumps, the rest of Byron Jackson's line was becoming obsolete.

Besides, Byron Jackson Pump was a company that prided itself on the old-fashioned virtues of hand-craftsmanship. In the latter half of the Sixties, it was still working with hand-controlled machine tools, still moved heavy parts around individually. Everything—small standard pumps and giant-sized specialties—were made in one big building. Scores of expeditors were in constant motion to keep the right bits and pieces moving to the right places.

Old-fashioned or not, this division could not be allowed to fade away.

Bob Bass had become group vice president for industrial equipment in 1966, and for two years, he says, "I felt as if I were banging my head against a brick wall" as far as Byron Jackson Pump was concerned. But under the combined prodding of Bass and of the new messages coming from the corporate office, practice slowly changed.

Manufacturing was modernized. A new plant made it possible to separate production of smaller standard equipment and big engineered specialties. Automated materials-handling systems were installed. Computer controls replaced individual hand-and-eye judgments on machine tools. Equally important, much of the line was redesigned to regain the competitive edge that had almost been lost.

It took the best part of eight years to make the physical changeover. Then came the next phase. Byron Jackson was reorganized under a new Energy Equipment group. Each of the major areas—BJ Pump, Centrilift and Mechanical Seal—got a separate identity and its own manager. Weston Hydraulics, a high-technology aerospace division, was converted into the Nuclear Valve division, producing precision valves for the nuclear generating process. Each unit had its own marketing needs. Mechanical seals, for instance, had been pretty much lost in the shuffle under the Byron Jackson operation.

In a mechanical seal, one face is stationary and the other rotates. Tolerances are so tight there is no leakage despite the pressure of the liquid pushed

through. They are essential to all pumping systems, and specialty items in their own right.

But that particular business is one in which service—getting the customer what he needs quickly—is critical. The unit responsible had not always been able to respond fast enough, within a bigger operation more concerned with other products. Once Mechanical Seal was placed on its own and able to establish its own priorities, sales and profits rose sharply.

With the changed approach, all parts of Byron Jackson, now in the Energy Equipment group, did better. Nuclear work still got emphasis. BJ has made nearly all the pumps used to move liquid sodium, a molten metal used as a heat transfer agent in some nuclear applications, and is doing development work on pumps for the next-generation fast breeder reactors. At the same time, more conventional equipment for fossil-fueled utilities also was able to gain a better position. In fact, just since 1974, the total Byron Jackson/Energy Equipment complex turned around from one of the least profitable operations in Borg-Warner to one of the most profitable.

The years between 1971 and 1976 had been inward-looking, but the results had been constructive. In 1971, the primary question had been, "How do we fix up what we have?" By the end of 1976, most of the objectives postulated at the beginning of the decade had been achieved.

The nonproductive activities were gone. Modern management systems—not unique, but new and necessary to Borg-Warner—had improved asset allocation, inventory turnover, receivables collection. Product quality had been improved in many areas. Communications had been opened up throughout the company—or at least a start had been made. A new internal organization was evolving in which divisions retained operating autonomy, but within much more clearly defined parameters of responsibility. Actual earnings were increasing, and even rates of return were inching up.

With the housecleaning largely done, Beré and his staff now had to face an equally vital question: "Where do we go from here?"

The company had in place a great deal of

capability, and there were unquestionably opportunities for growth within existing businesses. But essentially, most of those businesses were mature. The transportation equipment field was a case in point.

Transportation equipment had always been the largest single segment of Borg-Warner's business, still accounted for a third of the total, and would always remain a keystone of the corporation. Improved individual components were ready to take advantage of the swings to smaller cars, front-wheel and four-wheel drives, and increased use of utility vehicles.

Borg-Warner was reasonably sure of its ability to retain its position in the field, with its transportation equipment business likely to grow at least at the same 2-to-3 per cent annual rate expected for its customer market. Nevertheless, given the realities of the automotive world, explosive growth for any component supplier was unlikely.

Much of the same was true of the other major production areas. Air conditioning was now an inherent part of American life, utterly essential in the booming Sunbelt, but the rate of new construction was not rising. While obsolete equipment would continually be replaced by efficient, newer equipment like modern heat pumps, most growth would have to come from chipping away at competitors. Plastic consumption trends were still moving up, but much more slowly than a decade earlier.

If it just grew with its markets, the company would be stable, safe, and reasonably prosperous.

That wasn't good enough.

Borg-Warner did a comparative analysis of its businesses, assuming that it would be able to bring its efficiencies and rates of return in every case up to the level of the best of its competitors. Even that result would still not be what they wanted.

The company needed some new directions.

Not simply growth. Many of the decisions of the Fifties and Sixties had been motivated solely by the idea of growth per se, regardless of product, market or fit, and too much time and effort had gone into correcting those decisions.

There were two obvious possibilities. Within the framework of things that could be "produced," electronics was leading the world to new and different levels. And in terms of total economies and social patterns, consumption of services was begin-

ning to exceed consumption of things.

Borg-Warner was an expert "metal bender." In capacity for producing quality mechanical products, it had few peers. The world would always need mechanical muscles—but electronics was changing the way the muscles could be used, and Borg-Warner had little capability in the newer discipline.

There was no way Borg-Warner could buy into the electronics field on a meaningful scale. Nor did it want to lose its identity by being acquired by someone else. But it could try to find a partner to share expertise.

In 1977, it did just that, by offering to sell a piece of its equity to the German-based Robert Bosch GmbH. Bosch is one of Europe's leading electronic companies, producing across many markets. Bosch bought 2 million previously unissued shares of Borg-Warner, representing approximately 10 per cent of the common stock that would then be outstanding—with covenants limiting its future ownership to no more than that 10 per cent.

Only one joint venture had been undertaken in the first year of the partnership, but the combination of Borg-Warner's mechanical skills and Bosch's electronic capabilities promised products that will offer the best of both worlds.

With the start of the sixth decade, Borg-Warner was ready to start active expansion again.

Its basic manufacturing businesses, its financial condition, and its new organization were in excellent shape. Now, without detracting from manufacturing operations, the company could deliberately point toward the faster-growing service part of the economy.

Actually, Borg-Warner had been in the service business since 1953 with its finance company, but hadn't really understood that. Even though its earnings had risen uninterrupted for years, countering the cyclicity of the rest of the company, and even though it was finally set off in a Financial Services Group of its own, B-WAC was long regarded more as an exception than a direction. It wasn't until well into the Seventies that it was finally recognized as a model "service" operation.

There were a few other odd "service" bits and

With the start of the sixth decade, Borg-Warner was ready to start active expansion again.

pieces around the circuit. Borg-Warner Educational systems, for instance, had a toehold in the vast education field with an individualized audio-visual learning system and a large assortment of instruction program software. In the mid-Seventies, Borg-Warner had also picked up three small testing businesses and combined them in a system that monitored environmental, toxicity and safety factors for small companies around the country, transmitting data via telephone lines to a central location for analysis. With increasing government regulation, growth seemed inevitable—but would never be tremendous.

A lot more impact was wanted. When an acquisition investigation team started looking, there was no specific type of company in mind, except that it had to be a quality company. In general, the requirements were that a candidate would have to be a leader in its own industry, well-managed, with a good track record—and large enough to have an impact both within its own industry and upon Borg-Warner's revenues.

One of the early areas to catch the team's eye was protective services. "For good or for ill," notes one officer, "personal safety has become a major national concern within the last decade." Several organizations were looked at, and the team finally learned about Baker Industries of Parsippany, N.J.

Baker met all the criteria. It was large enough—revenues of \$185 million in 1977. It was one of the leaders in the protective services industry; its Wells Fargo armored car, guard and alarm services, and its industrial and residential fire detection and warning systems made it perhaps the broadest-based protective service organization in the country. Its revenues had risen for 20 years, unaffected by the cycles that influenced most Borg-Warner manufacturing operations.

Nobody in Borg-Warner knew anything about the security field, but with its basic autonomy system, that didn't matter too much. Baker's own management was strong and personally concerned. The personalities at the top of both companies meshed to an extraordinary degree. And Baker already had management controls very similar to those of Borg-Warner itself.

The merger became effective in early 1978. In its first full year under the Borg-Warner banner, Baker's own revenue rose by 13 per cent.

Borg-Warner was clearly in the service business. Financial services and protective services between them now accounted for about 20 per cent of Borg-Warner's earnings, and that proportion was expected to grow.

In its latest decade, Borg-Warner had changed considerably. Some of the ways could be quantified, but many more were intangible.

Technological competition somehow became cooperation. For instance, in the mid-Seventies, Borg & Beck was working on high-performance "wet" clutches. Byron Jackson needed a low-cost, variable speed drive for pumps. Both worked with the Research Center, and the three organizations together developed a continuously slipping wet clutch that could be used to drive pumps at various speeds. Out of that same original research has come still another rapidly growing product, Rockford's new fan drive that makes trucks quieter and more fuel efficient.

The most unquantifiable change of all is also one that is most generally agreed upon. There is a new spirit throughout Borg-Warner. Here is how one outside consultant, who has worked with many companies and has watched Borg-Warner for years, puts it:

"Borg-Warner used to be highly autocratic. Today, humanism permeates both strategy and day-to-day decisions. Somehow, I see less politics, less backbiting, less hassling than in a great many other companies. It's a much more open company. When people were given the opportunity to become more masters of their own destiny, they also had to give something in return, and that meant better quality of management from top to bottom. That has made an enormous difference in terms of attitude."

Béré puts it this way:

"Study excellent companies, and you find that invariably good profits go together with good working conditions and open communications. You almost can't have one without the other. If your people aren't satisfied, you're not going to make profits—and if you don't make profits, you can't keep your people satisfied. The real, maybe the

only, key to productivity is employee enthusiasm and support. I want everybody who is part of Borg-Warner to understand that providing for their well-being is a Borg-Warner objective—for good business reasons.”

Where now?

Borg-Warner intends to keep growing. Fifteen years ago, a billion dollars in annual sales was a major goal. Then it became \$2 billion. Now the company is realistically pointing toward \$5 billion.

At the beginning of its sixth decade, the company is exploring many directions. Some already in the offing seem even further afield than the most recent one.

Says Jim Beré:

“I don’t care what category we are listed in—we are a complex company and labels are not important—just as long as people call us a good company.

“We want our customers to know they can depend on our products.

“We want our shareholders to understand that we will always try to give them full information as well as a fair return on their investment.

“We want our plants to be models throughout industry for safety, for cleanliness, for physical working conditions. The housekeeping in every factory should be as good as in the chairman’s office.

“We want all of our employees to get satisfaction as well as income from their jobs...so much so that their kids, their friends, and their relatives will all say, ‘That’s a company I’d like to work for.’”

During its first 50 years, Borg-Warner has gone through many metamorphoses. Another turning point was reached just as this book went to press.

On November 29, 1978, most daily newspapers in the United States carried a startling headline. Borg-Warner and The Firestone Tire and Rubber Co., which had annual sales twice those of Borg-Warner, had “mutually agreed to consider” a merger of the two companies.

Such an announcement would be major news under any conditions. If consummated, the merger will be one of the largest in history.

It would result in a new holding company within which both Borg-Warner and Firestone would initially survive in essentially their current forms. The chief executive officer of the holding company would be James F. Beré.

It would be several months before the proposal could complete a journey through the labyrinth of legal requirements and of approvals not only by stockholders of both companies but also of a variety of government agencies. Plans can, as Robert Burns reminds us, “gang aft agley.”

But whatever happens, Borg-Warner clearly remains on the march.

The next 50 years should be even more exciting.



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